File Contents for the LASSO Alpha 1 Release

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July 2016

Alpha 1 Release Webpage:
http://www.arm.gov/science/themes/lasso/releases/

Alpha 1 Dataset DOI: 10.5439/1256454

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The following sections list the contents of the files contained in data bundles in this release. Most lists take the form of netCDF header dumps with the exception of one text file. The list is organized by the directory structure shown in Figure 2 of the accompanying "Description of the LASSO Alpha 1 Release." Files from Simulation ID 1 from the 6-Jun-2015 case are used as an example.

File: .../20150606/metrics/sgplassostatC1.c1.20150606.000000.nc

Description: Contains metrics for surface meteorology and cloud variables comparing the simulations in the case to observations.

```
netcdf sgplassostatC1.c1.20150606.000000 {
dimensions:
        time = UNLIMITED ; // (1 currently)
        bound = 2 ;
        simulation_id = 40 ;
        variable = 11 ;
        variable_name_length = 100 ;
variables:
        int base_time ;
                base_time:long_name = "Base time in Epoch" ;
                base_time:units = "seconds since 1970-1-1 0:00:00 0:00" ;
                base_time:ancillary_variables = "time_offset" ;
        double time_offset(time) ;
                time_offset:long_name = "Time offset from base_time" ;
                time_offset:units = "seconds since 2015-06-06 11:30:00 0:00" ;
                time_offset:ancillary_variables = "base_time" ;
        double time(time) ;
                time:long_name = "Time offset from midnight" ;
                time:bounds = "time_bounds" ;
                time:calendar = "gregorian" ;
                time:standard_name = "time" ;
        double time_bounds(time, bound) ;
                time_bounds:long_name = "Time cell bounds" ;
        float simulation_id(simulation_id) ;
                simulation_id:long_name = "Simulation ID" ;
                simulation_id:units = "unitless" ;
        int variable(variable) ;
                variable:long_name = "Variable" ;
                variable:units = "unitless" ;
        char variable_name(variable, variable_name_length) ;
                variable_name:long_name = "Variable name" ;
                variable_name:units = "unitless" ;
        float taylor_skill(time, variable, simulation_id) ;
                taylor_skill:long_name = "Taylor skill score" ;
                taylor_skill:units = "unitless" ;
                taylor_skill:missing_value = "-9999.f" ;
        float taylor_r0(time, variable, simulation_id) ;
                taylor_r0:long_name = "taylor_r0" ;
                taylor_r0:units = "unitless" ;
                taylor_r0:missing_value = "-9999.f" ;
        float relative_mean_skill(time, variable, simulation_id) ;
                relative_mean_skill:long_name = "Skill of relative mean" ;
                relative_mean_skill:units = "unitless" ;
                relative_mean_skill:missing_value = "-9999.f" ;
        float net_skill(time, variable, simulation_id) ;
                net_skill:long_name = "Skill of: relative mean skill and taylor skill" ;
                net_skill:units = "unitless" ;
                net_skill:missing_value = "-9999.f" ;
        float cloud_1d_skill(time, simulation_id) ;
```

```
                cloud_1d_skill:long_name = "Skill of: LWP net skill and TSI cloud fraction net skill" ;
                cloud_1d_skill:units = "unitless" ;
                cloud_1d_skill:missing_value = "-9999.f" ;
        float total_cloud_skill(time, simulation_id) ;
                total_cloud_skill:long_name = "Skill of: cloud mask net skill and 1D cloud skill (cloud_1d_skill)" ;
                total_cloud_skill:units = "unitless" ;
                total_cloud_skill:missing_value = "-9999.f" ;
                total_cloud_skill:comments = "Cloud mask net skill found in datastream: lassostat2d.c" ;

// global attributes:
                :Conventions = "ARM-1.1" ;
                :process_version = "Alpha 1 Release" ;
                :dod_version = "lassostat.c1-1.0.hdr" ;
                :input_datastreams = " " ;
                :site_id = "sgp" ;
                :platform_id = "lassostat" ;
                :facility_id = "C1" ;
                :data_level = "c1" ;
                :location_description = "Southern Great Plains (SGP), Lamont, Oklahoma" ;
                :doi = "10.5439/1256454" ;
                :history = "Thu Jun 23 01:54:37 2016" ;
}
```

File: .../20150606/metrics/sgplassostat2dC1.c1.20150606.txt

Description: Metrics by simulation for the cloud skill scores.

Simulation ID, Critical Success Index (CSI), Equitable Threat Score (ETS) Bias, ETS, ETS Skill, ETS Bias Skill, 2D Cloud Mask Net Skill

1	0.19	1.19	0.36	0.36	0.84	0.55
2	0.19	1.39	0.38	0.38	0.72	0.52
3	0.19	1.50	0.41	0.41	0.66	0.52
4	0.18	1.48	0.35	0.35	0.67	0.49

…

File: .../20150606/sim0001/obs_model/sgplassomod1C1.c1.20150606.000000.nc

Description: Model output for domain-averaged profiles at 15 minute intervals for variables used in the metrics.

```
netcdf sgplassomod1C1.c1.20150606.000000 {
dimensions:
        time = UNLIMITED ; // (61 currently)
variables:
        int base_time ;
                base_time:long_name = "Base time in Epoch" ;
                base_time:units = "seconds since 1970-1-1 0:00:00 0:00" ;
                base_time:ancillary_variables = "time_offset" ;
        double time_offset(time) ;
                time_offset:long_name = "Time offset from base_time" ;
                time_offset:units = "seconds since 2015-06-06 12:00:00 0:00" ;
                time_offset:ancillary_variables = "base_time" ;
        double time(time) ;
                time:long_name = "Time offset from midnight" ;
                time:bounds = "time_bounds" ;
                time:calendar = "gregorian" ;
                time:standard_name = "time" ;
        float low_cloud_fraction_arscl(time) ;
                low_cloud_fraction_arscl:long_name = "Frequency of 15-min cloud occurrence, as identified by ARSCL, below
5km AGL" ;
                low_cloud_fraction_arscl:units = "1" ;
```

```
            low_cloud_fraction_arscl:missing_value = "-9999.f" ;
            low_cloud_fraction_arscl:valid_min = "0.f" ;
            low_cloud_fraction_arscl:valid_max = "1.f" ;
            low_cloud_fraction_arscl:cell_methods = "time: mean" ;
            low_cloud_fraction_arscl:ancillary_variables = "qc_low_cloud_fraction_arscl" ;
        float cloud_fraction_tsi(time) ;
            cloud_fraction_tsi:long_name = "Hemispheric cloud fraction, as identified by TSI (opaque)" ;
            cloud_fraction_tsi:units = "1" ;
            cloud_fraction_tsi:missing_value = "-9999.f" ;
            cloud_fraction_tsi:valid_min = "0.f" ;
            cloud_fraction_tsi:valid_max = "1.f" ;
            cloud_fraction_tsi:cell_methods = "time: mean" ;
            cloud_fraction_tsi:ancillary_variables = "qc_cloud_fraction_tsi" ;
        float lwp(time) ;
            lwp:long_name = "Liquid water path" ;
            lwp:units = "g m-2" ;
            lwp:missing_value = "-9999.f" ;
            lwp:cell_methods = "time: mean" ;
            lwp:ancillary_variables = "qc_lwp" ;
        float lcl(time) ;
            lcl:long_name = "Lifting condensation level" ;
            lcl:units = "m" ;
            lcl:missing_value = "-9999.f" ;
            lcl:cell_methods = "time: mean" ;
            lcl:ancillary_variables = "qc_lcl" ;
        float water_vapor_mixing_ratio_surface(time) ;
            water_vapor_mixing_ratio_surface:long_name = "Water vapor mixing ratio at surface" ;
            water_vapor_mixing_ratio_surface:units = "g kg-1" ;
            water_vapor_mixing_ratio_surface:missing_value = "-9999.f" ;
            water_vapor_mixing_ratio_surface:cell_methods = "time: mean" ;
            water_vapor_mixing_ratio_surface:ancillary_variables = "qc_water_vapor_mixing_ratio_surface" ;
        float temperature_surface(time) ;
            temperature_surface:long_name = "Temperature at surface" ;
            temperature_surface:units = "K" ;
            temperature_surface:missing_value = "-9999.f" ;
            temperature_surface:cell_methods = "time: mean" ;
            temperature_surface:ancillary_variables = "qc_temperature_surface" ;
        float pressure_surface(time) ;
            pressure_surface:long_name = "Pressure at surface" ;
            pressure_surface:units = "kPa" ;
            pressure_surface:missing_value = "-9999.f" ;
            pressure_surface:cell_methods = "time: mean" ;
            pressure_surface:ancillary_variables = "qc_pressure_surface" ;
        float rh_surface(time) ;
            rh_surface:long_name = "Relative humidity" ;
            rh_surface:units = "%" ;
            rh_surface:missing_value = "-9999.f" ;
            rh_surface:cell_methods = "time: mean" ;
            rh_surface:ancillary_variables = "qc_rh_surface" ;
        float water_vapor_mixing_ratio_boundary_layer(time) ;
            water_vapor_mixing_ratio_boundary_layer:long_name = "Water vapor mixing ratio; average of boundary layer" ;
            water_vapor_mixing_ratio_boundary_layer:units = "g kg-1" ;
            water_vapor_mixing_ratio_boundary_layer:missing_value = "-9999.f" ;
            water_vapor_mixing_ratio_boundary_layer:cell_methods = "time: mean" ;
            water_vapor_mixing_ratio_boundary_layer:ancillary_variables = "qc_water_vapor_mixing_ratio_boundary_layer"
;
        float temperature_boundary_layer(time) ;
            temperature_boundary_layer:long_name = "Temperature; average of boundary layer" ;
            temperature_boundary_layer:units = "K" ;
            temperature_boundary_layer:missing_value = "-9999.f" ;
            temperature_boundary_layer:cell_methods = "time: mean" ;
            temperature_boundary_layer:ancillary_variables = "qc_temperature_boundary_layer" ;
```

```
        float pressure_boundary_layer(time) ;
                pressure_boundary_layer:long_name = "Pressure; average of boundary layer" ;
                pressure_boundary_layer:units = "kPa" ;
                pressure_boundary_layer:missing_value = "-9999.f" ;
                pressure_boundary_layer:cell_methods = "time: mean" ;
                pressure_boundary_layer:ancillary_variables = "qc_pressure_boundary_layer" ;
        float rh_boundary_layer(time) ;
                rh_boundary_layer:long_name = "Relative humidity; average of boundary layer" ;
                rh_boundary_layer:units = "%" ;
                rh_boundary_layer:missing_value = "-9999.f" ;
                rh_boundary_layer:cell_methods = "time: mean" ;
                rh_boundary_layer:ancillary_variables = "qc_rh_boundary_layer" ;

// global attributes:
                :Conventions = "ARM-1.1" ;
                :process_version = "Alpha 1 Release" ;
                :dod_version = "lassomod.c1-1.0.hdr" ;
                :input_datastreams = "/lustre/atlas1/cli120/proj-shared/sendo3/runs/agu15runs/runlas150606aguvar1/wrfout_
d01_*-*-*_*:*:00" ;
                :site_id = "sgp" ;
                :platform_id = "lassomod" ;
                :facility_id = "C1" ;
                :data_level = "c1" ;
                :location_description = "Southern Great Plains (SGP), Lamont, Oklahoma" ;
                :simulation_id_number = "1" ;
                :model_type = "WRF" ;
                :model_version = "3.7" ;
                :output_domain_size = "25.6 km" ;
                :output_number_of_levels = "336 levels" ;
                :output_horizontal_grid_spacing = "100 m" ;
                :config_large_scale_forcing = "VARANAL" ;
                :config_large_scale_forcing_scale = "300 km" ;
                :config_large_scale_forcing_specifics = "VARANARAP LAND" ;
                :config_surface_treatment = "VARANAL" ;
                :config_surface_treatment_specifics = "VARANARAP LAND" ;
                :config_initial_condition = "SONDE" ;
                :config_initial_condition_specifics = "SONDE" ;
                :config_aerosol = "constant" ;
                :config_forecast_time = "15 hours" ;
                :config_boundary_method = "periodic" ;
                :config_microphysics = "Morrison" ;
                :config_nickname = "runlas150606aguvar1" ;
                :config_comments = "AGU run; contains random number seed repetition feature in initial conditions (minimal
impact to clouds)" ;
                :boundary_layer_top = "1100 m AGL" ;
                :boundary_layer_bottom = "900 m AGL" ;
                :contacts = "William.Gustafson@pnnl.gov, Vogelmann@bnl.gov" ;
                :doi = "10.5439/1256454" ;
                :history = "Wed Jun 22 13:49:50 2016" ;
}
```

File: .../20150606/sim0001/obs_model/sgplassodiagobsmod1C1.c1.20150606.000000.nc

Description: Directly comparable model output from sgplassomod1C1.c1.20150606.000000 and observations on coincident time intervals.

```
netcdf sgplassodiagobsmod1C1.c1.20150606.000000 {
dimensions:
        time = UNLIMITED ; // (29 currently)
        source_type = 2 ;
```

```
variables:
        int base_time ;
                base_time:long_name = “Base time in Epoch” ;
                base_time:units = “seconds since 1970-1-1 0:00:00 0:00” ;
                base_time:ancillary_variables = “time_offset” ;
        double time_offset(time) ;
                time_offset:long_name = “Time offset from base_time” ;
                time_offset:units = “seconds since 2015-06-06 00:00:00 0:00” ;
                time_offset:ancillary_variables = “base_time” ;
                time_offset:comment = “time offset corresponds to center of averaging interval” ;
        double time(time) ;
                time:long_name = “Time offset from midnight” ;
                time:bounds = “time_bounds” ;
                time:calendar = “gregorian” ;
                time:standard_name = “time” ;
        int source_type(source_type) ;
                source_type:long_name = “Type of data source” ;
                source_type:units = “unitless” ;
                source_type:description = “This field contains integer values which should be interpreted as listed.” ;
                source_type:flag_method = “integer” ;
                source_type:flag_0_description = “Observation” ;
                source_type:flag_1_description = “Model” ;
        float low_cloud_fraction_arscl(time, source_type) ;
                low_cloud_fraction_arscl:long_name = “Frequency of 15-min cloud occurrence, as identified by ARSCL, below
5km AGL” ;
                low_cloud_fraction_arscl:units = “1” ;
                low_cloud_fraction_arscl:missing_value = “-9999.f” ;
                low_cloud_fraction_arscl:valid_min = “0.f” ;
                low_cloud_fraction_arscl:valid_max = “1.f” ;
                low_cloud_fraction_arscl:cell_methods = “time: mean” ;
                low_cloud_fraction_arscl:ancillary_variables = “qc_low_cloud_fraction_arscl low_cloud_fraction_arscl_goodfrac-
tion” ;
        int qc_low_cloud_fraction_arscl(time, source_type) ;
                qc_low_cloud_fraction_arscl:long_name = “Quality check results on field: Frequency of 15-min cloud occur-
rence, as identified by ARSCL, be” ;
                qc_low_cloud_fraction_arscl:units = “unitless” ;
                qc_low_cloud_fraction_arscl:description = “This field contains bit packed integer values, where each bit represents
a QC test on the data.” ;
                qc_low_cloud_fraction_arscl:flag_method = “bit” ;
                qc_low_cloud_fraction_arscl:bit_1_description = “Calculated with valid points between 30% and 50%” ;
                qc_low_cloud_fraction_arscl:bit_2_description = “Calculated with valid points less than 30%” ;
                qc_low_cloud_fraction_arscl:bit_2_assessment = “Bad” ;
                qc_low_cloud_fraction_arscl:bit_1_assessment = “Indeterminate” ;
        double low_cloud_fraction_arscl_goodfraction(time, source_type) ;
                low_cloud_fraction_arscl_goodfraction:long_name = “Metric goodfraction for Frequency of 15-min cloud occur-
rence, as identified by ARSCL, below 5km” ;
                low_cloud_fraction_arscl_goodfraction:units = “unitless” ;
                low_cloud_fraction_arscl_goodfraction:missing_value = “-9999.” ;
        float low_cloud_fraction_arscl_std(time, source_type) ;
                low_cloud_fraction_arscl_std:long_name = “Metric standard deviation for field Frequency of 15-min cloud
occurrence, as identified by ARSC” ;
                low_cloud_fraction_arscl_std:units = “m” ;
                low_cloud_fraction_arscl_std:missing_value = “-9999.f” ;
        float cloud_fraction_tsi(time, source_type) ;
                cloud_fraction_tsi:long_name = “Hemispheric cloud fraction, as identified by TSI (opaque)” ;
                cloud_fraction_tsi:units = “1” ;
                cloud_fraction_tsi:missing_value = “-9999.f” ;
                cloud_fraction_tsi:valid_min = “0.f” ;
                cloud_fraction_tsi:valid_max = “1.f” ;
                cloud_fraction_tsi:cell_methods = “time: mean” ;
                cloud_fraction_tsi:ancillary_variables = “qc_cloud_fraction_tsi cloud_fraction_tsi_goodfraction” ;
        int qc_cloud_fraction_tsi(time, source_type) ;
```

qc_cloud_fraction_tsi:long_name = “Quality check results on field: Hemispheric cloud fraction, as identified by TSI (opaque)” ;
qc_cloud_fraction_tsi:units = “unitless” ;
qc_cloud_fraction_tsi:description = “This field contains bit packed integer values, where each bit represents a QC test on the data.” ;
qc_cloud_fraction_tsi:flag_method = “bit” ;
qc_cloud_fraction_tsi:bit_1_description = “Calculated with valid points between 30% and 50%” ;
qc_cloud_fraction_tsi:bit_1_assessment = “Indeterminate” ;
qc_cloud_fraction_tsi:bit_2_description = “Calculated with valid points less than 30%” ;
qc_cloud_fraction_tsi:bit_2_assessment = “Bad” ;
float cloud_fraction_tsi_goodfraction(time, source_type) ;
cloud_fraction_tsi_goodfraction:long_name = “Metric goodfraction for Hemispheric cloud fraction, as identified by TSI (opaque)” ;
cloud_fraction_tsi_goodfraction:units = “unitless” ;
cloud_fraction_tsi_goodfraction:missing_value = “-9999.f” ;
float cloud_fraction_tsi_std(time, source_type) ;
cloud_fraction_tsi_std:long_name = “Metric standard deviation for field Hemispheric cloud fraction, as identified by TSI (opaque)” ;
cloud_fraction_tsi_std:units = “1” ;
cloud_fraction_tsi_std:missing_value = “-9999.f” ;
float lwp(time, source_type) ;
lwp:long_name = “Liquid water path” ;
lwp:units = “g m-2” ;
lwp:missing_value = “-9999.f” ;
lwp:cell_methods = “time: mean” ;
lwp:ancillary_variables = “qc_lwp lwp_goodfraction” ;
int qc_lwp(time, source_type) ;
qc_lwp:long_name = “Quality check results on field: Liquid water path” ;
qc_lwp:units = “unitless” ;
qc_lwp:description = “This field contains bit packed integer values, where each bit represents a QC test on the data.” ;
qc_lwp:flag_method = “bit” ;
qc_lwp:bit_1_description = “Calculated with valid points between 30% and 50%” ;
qc_lwp:bit_1_assessment = “Indeterminate” ;
qc_lwp:bit_2_description = “Calculated with valid points less than 30%” ;
qc_lwp:bit_2_assessment = “Bad” ;
float lwp_goodfraction(time, source_type) ;
lwp_goodfraction:long_name = “Metric goodfraction for Liquid water path” ;
lwp_goodfraction:units = “unitless” ;
lwp_goodfraction:missing_value = “-9999.f” ;
float lwp_std(time, source_type) ;
lwp_std:long_name = “Metric standard deviation for field Liquid water path” ;
lwp_std:units = “g m-2” ;
lwp_std:missing_value = “-9999.f” ;
float lcl(time, source_type) ;
lcl:long_name = “Lifting condensation level” ;
lcl:units = “m” ;
lcl:missing_value = “-9999.f” ;
lcl:cell_methods = “time: mean” ;
lcl:ancillary_variables = “qc_lcl lcl_goodfraction” ;
int qc_lcl(time, source_type) ;
qc_lcl:long_name = “Quality check results on field: Lifting condensation level” ;
qc_lcl:units = “unitless” ;
qc_lcl:description = “This field contains bit packed integer values, where each bit represents a QC test on the data.” ;
qc_lcl:flag_method = “bit” ;
qc_lcl:bit_1_description = “Calculated with valid points between 30% and 50%” ;
qc_lcl:bit_1_assessment = “Indeterminate” ;
qc_lcl:bit_2_description = “Calculated with valid points less than 30%” ;
qc_lcl:bit_2_assessment = “Bad” ;
float lcl_goodfraction(time, source_type) ;
lcl_goodfraction:long_name = “Metric goodfraction for Lifting condensation level” ;

```
                lcl_goodfraction:units = “unitless” ;
                lcl_goodfraction:missing_value = “-9999.f” ;
        float lcl_std(time, source_type) ;
                lcl_std:long_name = “Metric standard deviation for field Lifting condensation level” ;
                lcl_std:units = “m” ;
                lcl_std:missing_value = “-9999.f” ;
        float water_vapor_mixing_ratio_surface(time, source_type) ;
                water_vapor_mixing_ratio_surface:long_name = “Water vapor mixing ratio at surface” ;
                water_vapor_mixing_ratio_surface:units = “g kg-1” ;
                water_vapor_mixing_ratio_surface:missing_value = “-9999.f” ;
                water_vapor_mixing_ratio_surface:cell_methods = “time: mean” ;
                water_vapor_mixing_ratio_surface:ancillary_variables = “qc_water_vapor_mixing_ratio_surface” ;
        int qc_water_vapor_mixing_ratio_surface(time, source_type) ;
                qc_water_vapor_mixing_ratio_surface:long_name = “Quality check results on field: Water vapor mixing ratio at
surface” ;
                qc_water_vapor_mixing_ratio_surface:units = “unitless” ;
                qc_water_vapor_mixing_ratio_surface:description = “This field contains bit packed integer values, where each bit
represents a QC test on the data.” ;
                qc_water_vapor_mixing_ratio_surface:flag_method = “bit” ;
                qc_water_vapor_mixing_ratio_surface:bit_1_description = “Calculated with valid points between 30% and 50%”
;
                qc_water_vapor_mixing_ratio_surface:bit_1_assessment = “Indeterminate” ;
                qc_water_vapor_mixing_ratio_surface:bit_2_description = “Calculated with valid points less than 30%” ;
                qc_water_vapor_mixing_ratio_surface:bit_2_assessment = “Bad” ;
        float water_vapor_mixing_ratio_surface_std(time, source_type) ;
                water_vapor_mixing_ratio_surface_std:long_name = “Metric standard deviation for field Water vapor mixing
ratio at surface” ;
                water_vapor_mixing_ratio_surface_std:units = “g kg-1” ;
                water_vapor_mixing_ratio_surface_std:missing_value = “-9999.f” ;
        float water_vapor_mixing_ratio_surface_goodfraction(time, source_type) ;
                water_vapor_mixing_ratio_surface_goodfraction:long_name = “Metric goodfraction for Water vapor mixing ratio
at surface” ;
                water_vapor_mixing_ratio_surface_goodfraction:units = “unitless” ;
                water_vapor_mixing_ratio_surface_goodfraction:missing_value = “-9999.f” ;
        float temperature_surface(time, source_type) ;
                temperature_surface:long_name = “Temperature at surface” ;
                temperature_surface:units = “K” ;
                temperature_surface:missing_value = “-9999.f” ;
                temperature_surface:cell_methods = “time: mean” ;
                temperature_surface:ancillary_variables = “qc_temperature_surface” ;
        int qc_temperature_surface(time, source_type) ;
                qc_temperature_surface:long_name = “Quality check results on field: Temperature at surface” ;
                qc_temperature_surface:units = “unitless” ;
                qc_temperature_surface:description = “This field contains bit packed integer values, where each bit represents a
QC test on the data.” ;
                qc_temperature_surface:flag_method = “bit” ;
                qc_temperature_surface:bit_1_description = “Calculated with valid points between 30% and 50%” ;
                qc_temperature_surface:bit_1_assessment = “Indeterminate” ;
                qc_temperature_surface:bit_2_description = “Calculated with valid points less than 30%” ;
                qc_temperature_surface:bit_2_assessment = “Bad” ;
        float temperature_surface_std(time, source_type) ;
                temperature_surface_std:long_name = “Metric standard deviation for field Temperature at surface” ;
                temperature_surface_std:units = “K” ;
                temperature_surface_std:missing_value = “-9999.f” ;
        float temperature_surface_goodfraction(time, source_type) ;
                temperature_surface_goodfraction:long_name = “Metric goodfraction for Temperature at surface” ;
                temperature_surface_goodfraction:units = “unitless” ;
                temperature_surface_goodfraction:missing_value = “-9999.f” ;
        float rh_surface(time, source_type) ;
                rh_surface:long_name = “Relative humidity” ;
                rh_surface:units = “%” ;
                rh_surface:missing_value = “-9999.f” ;
```

rh_surface:cell_methods = “time: mean” ;
rh_surface:ancillary_variables = “qc_rh_surface” ;
int qc_rh_surface(time, source_type) ;
qc_rh_surface:long_name = “Quality check results on field: Relative humidity” ;
qc_rh_surface:units = “unitless” ;
qc_rh_surface:description = “This field contains bit packed integer values, where each bit represents a QC test on the data.” ;
qc_rh_surface:flag_method = “bit” ;
qc_rh_surface:bit_1_description = “Calculated with valid points between 30% and 50%” ;
qc_rh_surface:bit_1_assessment = “Indeterminate” ;
qc_rh_surface:bit_2_description = “Calculated with valid points less than 30%” ;
qc_rh_surface:bit_2_assessment = “Bad” ;
float rh_surface_std(time, source_type) ;
rh_surface_std:long_name = “Metric standard deviation for field Relative humidity at surface” ;
rh_surface_std:units = “%” ;
rh_surface_std:missing_value = “-9999.f” ;
float rh_surface_goodfraction(time, source_type) ;
rh_surface_goodfraction:long_name = “Metric goodfraction for Relative humidity at surface” ;
rh_surface_goodfraction:units = “unitless” ;
rh_surface_goodfraction:missing_value = “-9999.f” ;
float water_vapor_mixing_ratio_boundary_layer(time, source_type) ;
water_vapor_mixing_ratio_boundary_layer:long_name = “Water vapor mixing ratio; average of boundary layer” ;
water_vapor_mixing_ratio_boundary_layer:units = “g kg-1” ;
water_vapor_mixing_ratio_boundary_layer:missing_value = “-9999.f” ;
water_vapor_mixing_ratio_boundary_layer:cell_methods = “time: mean” ;
water_vapor_mixing_ratio_boundary_layer:ancillary_variables = “qc_water_vapor_mixing_ratio_boundary_layer” ;
int qc_water_vapor_mixing_ratio_boundary_layer(time, source_type) ;
qc_water_vapor_mixing_ratio_boundary_layer:long_name = “Quality check results on field: Water vapor mixing ratio; average of boundary layer” ;
qc_water_vapor_mixing_ratio_boundary_layer:units = “unitless” ;
qc_water_vapor_mixing_ratio_boundary_layer:description = “This field contains bit packed integer values, where each bit represents a QC test on the data.” ;
qc_water_vapor_mixing_ratio_boundary_layer:flag_method = “bit” ;
qc_water_vapor_mixing_ratio_boundary_layer:bit_1_description = “Calculated with valid points between 30% and 50%” ;
qc_water_vapor_mixing_ratio_boundary_layer:bit_1_assessment = “Indeterminate” ;
qc_water_vapor_mixing_ratio_boundary_layer:bit_2_description = “Calculated with valid points less than 30%” ;
qc_water_vapor_mixing_ratio_boundary_layer:bit_2_assessment = “Bad” ;
float water_vapor_mixing_ratio_boundary_layer_std(time, source_type) ;
water_vapor_mixing_ratio_boundary_layer_std:long_name = “Metric standard deviation for field Water vapor mixing ratio: average of boundary layer” ;
water_vapor_mixing_ratio_boundary_layer_std:units = “g kg-1” ;
water_vapor_mixing_ratio_boundary_layer_std:missing_value = “-9999.f” ;
float water_vapor_mixing_ratio_boundary_layer_goodfraction(time, source_type) ;
water_vapor_mixing_ratio_boundary_layer_goodfraction:long_name = “Metric goodfraction for Water vapor mixing ratio: average of boundary layer” ;
water_vapor_mixing_ratio_boundary_layer_goodfraction:units = “unitless” ;
water_vapor_mixing_ratio_boundary_layer_goodfraction:missing_value = “-9999.f” ;
float temperature_boundary_layer(time, source_type) ;
temperature_boundary_layer:long_name = “Temperature; average of boundary layer” ;
temperature_boundary_layer:units = “K” ;
temperature_boundary_layer:missing_value = “-9999.f” ;
temperature_boundary_layer:cell_methods = “time: mean” ;
temperature_boundary_layer:ancillary_variables = “qc_temperature_boundary_layer” ;
int qc_temperature_boundary_layer(time, source_type) ;
qc_temperature_boundary_layer:long_name = “Quality check results on field: Temperature; average of boundary layer” ;
qc_temperature_boundary_layer:units = “unitless” ;
qc_temperature_boundary_layer:description = “This field contains bit packed integer values, where each bit represents a QC test on the data.” ;

```
                qc_temperature_boundary_layer:flag_method = “bit” ;
                qc_temperature_boundary_layer:bit_1_description = “Calculated with valid points between 30% and 50%” ;
                qc_temperature_boundary_layer:bit_1_assessment = “Indeterminate” ;
                qc_temperature_boundary_layer:bit_2_description = “Calculated with valid points less than 30%” ;
                qc_temperature_boundary_layer:bit_2_assessment = “Bad” ;
        float temperature_boundary_layer_std(time, source_type) ;
                temperature_boundary_layer_std:long_name = “Metric standard deviation for field Temperature: average of
boundary layer” ;
                temperature_boundary_layer_std:units = “K” ;
                temperature_boundary_layer_std:missing_value = “-9999.f” ;
        float temperature_boundary_layer_goodfraction(time, source_type) ;
                temperature_boundary_layer_goodfraction:long_name = “Metric goodfraction for Temperature: average of
boundary layer” ;
                temperature_boundary_layer_goodfraction:units = “unitless” ;
                temperature_boundary_layer_goodfraction:missing_value = “-9999.f” ;
        float rh_boundary_layer(time, source_type) ;
                rh_boundary_layer:long_name = “Relative humidity; average of boundary layer” ;
                rh_boundary_layer:units = “%” ;
                rh_boundary_layer:missing_value = “-9999.f” ;
                rh_boundary_layer:cell_methods = “time: mean” ;
                rh_boundary_layer:ancillary_variables = “qc_rh_boundary_layer” ;
        int qc_rh_boundary_layer(time, source_type) ;
                qc_rh_boundary_layer:long_name = “Quality check results on field: Relative humidity; average of boundary
layer” ;
                qc_rh_boundary_layer:units = “unitless” ;
                qc_rh_boundary_layer:description = “This field contains bit packed integer values, where each bit represents a
QC test on the data.” ;
                qc_rh_boundary_layer:flag_method = “bit” ;
                qc_rh_boundary_layer:bit_1_description = “Calculated with valid points between 30% and 50%” ;
                qc_rh_boundary_layer:bit_1_assessment = “Indeterminate” ;
                qc_rh_boundary_layer:bit_2_description = “Calculated with valid points less than 30%” ;
                qc_rh_boundary_layer:bit_2_assessment = “Bad” ;
        float rh_boundary_layer_std(time, source_type) ;
                rh_boundary_layer_std:long_name = “Metric standard deviation for field Relative humidity: average of boundary
layer” ;
                rh_boundary_layer_std:units = “%” ;
                rh_boundary_layer_std:missing_value = “-9999.f” ;
        float rh_boundary_layer_goodfraction(time, source_type) ;
                rh_boundary_layer_goodfraction:long_name = “Metric goodfraction for Relative humidity: average of boundary
layer” ;
                rh_boundary_layer_goodfraction:units = “unitless” ;
                rh_boundary_layer_goodfraction:missing_value = “-9999.f” ;

// global attributes:
                :Conventions = “ARM-1.1” ;
                :process_version = “Alpha 1 Release” ;
                :dod_version = “lassodiagobsmod.c1-1.0.hdr” ;
                :input_datastreams = “/home/ttoto/dev/vap/src/lassodiagobsmod/DATA/data/datastream/sgp/sgplassodiag-
modC1.c1/sgplassodiagmod1C1.c1.20150606.000000.nc” ;
                :site_id = “sgp” ;
                :platform_id = “lassodiagobsmod” ;
                :facility_id = “C1” ;
                :data_level = “c1” ;
                :location_description = “Southern Great Plains (SGP), Lamont, Oklahoma” ;
                :simulation_id_number = “1” ;
                :model_type = “WRF” ;
                :model_version = “3.7” ;
                :output_domain_size = “25.6 km” ;
                :output_number_of_levels = “336 levels” ;
                :output_horizontal_grid_spacing = “100 m” ;
                :config_large_scale_forcing = “VARANAL” ;
                :config_large_scale_forcing_scale = “300 km” ;
```

```
                :config_large_scale_forcing_specifics = “VARANARAP LAND” ;
                :config_surface_treatment = “VARANAL” ;
                :config_surface_treatment_specifics = “VARANARAP LAND” ;
                :config_initial_condition = “SONDE” ;
                :config_initial_condition_specifics = “SONDE” ;
                :config_aerosol = “constant” ;
                :config_forecast_time = “15 hours” ;
                :config_boundary_method = “periodic” ;
                :config_microphysics = “Morrison” ;
                :config_nickname = “runlas150606aguvar1” ;
                :config_comments = “AGU run; contains random number seed repetition feature in initial conditions (minimal
impact to clouds)” ;
                :boundary_layer_top = “1100 m AGL” ;
                :boundary_layer_bottom = “900 m AGL” ;
                :contacts = “William.Gustafson@pnnl.gov, Vogelmann@bnl.gov” ;
                :doi = “10.5439/1256454” ;
                :history = “Thu Jun 23 11:21:19 2016” ;
}
```

File: .../20150606/sim0001/obs_model/sgplassodiagobsmod2d1C1.c1.20150606.000000.nc

Description: Model output and observations for time-height cloud fraction.

```
netcdf sgplassodiagobsmod2d1C1.c1.20150606.000000 {
dimensions:
        time = UNLIMITED ; // (61 currently)
        height = 336 ;
variables:
        int base_time ;
                base_time:long_name = “Base time in Epoch” ;
                base_time:units = “seconds since 1970-1-1 0:00:00 0:00” ;
                base_time:ancillary_variables = “time_offset” ;
        double time_offset(time) ;
                time_offset:long_name = “Time offset from base_time” ;
                time_offset:units = “seconds since 2015-06-06 12:00:00 0:00” ;
                time_offset:ancillary_variables = “base_time” ;
                time_offset:comment = “time offset corresponds to center of averaging interval” ;
        double time(time) ;
                time:long_name = “Time offset from midnight” ;
                time:bounds = “time_bounds” ;
                time:calendar = “gregorian” ;
                time:standard_name = “time” ;
        float height(time, height) ;
                height:long_name = “Height above ground level” ;
                height:units = “km” ;
                height:standard_name = “height” ;
        float cloud_fraction(time, height) ;
                cloud_fraction:long_name = “Cloud fraction” ;
                cloud_fraction:units = “1” ;
                cloud_fraction:missing_value = “-9999.f” ;
                cloud_fraction:valid_min = “0.f” ;
                cloud_fraction:valid_max = “1.f” ;
        float cloud_fraction_mask_arscl(time, height) ;
                cloud_fraction_mask_arscl:long_name = “Cloud fraction mask (from ARSCL)” ;
                cloud_fraction_mask_arscl:units = “unitless” ;
                cloud_fraction_mask_arscl:description = “This field contains integer values which should be interpreted as listed.”
;
                cloud_fraction_mask_arscl:flag_method = “integer” ;
                cloud_fraction_mask_arscl:flag_0_description = “no cloud” ;
                cloud_fraction_mask_arscl:flag_1_description = “cloud” ;
```

```
                cloud_fraction_mask_arscl:flag_2_description = “no data available” ;

// global attributes:
                :Conventions = “ARM-1.1” ;
                :process_version = “Alpha 1 Release” ;
                :dod_version = “lassodiagobsmod2d.c1-1.0.hdr” ;
                :input_datastreams = “/home/ttoto/dev/vap/src/lassodiagobsmod2d/DATA/data/datastream/sgp/sgplassomod-
2dC1.c1/sgplassomod2d1C1.c1.20150606.000000.nc” ;
                :site_id = “sgp” ;
                :platform_id = “lassodiagobsmod2d” ;
                :facility_id = “C1” ;
                :data_level = “c1” ;
                :location_description = “Southern Great Plains (SGP), Lamont, Oklahoma” ;
                :simulation_id_number = “1” ;
                :model_type = “WRF” ;
                :model_version = “3.7” ;
                :output_domain_size = “25.6 km” ;
                :output_number_of_levels = “336 levels” ;
                :output_horizontal_grid_spacing = “100 m” ;
                :config_large_scale_forcing = “VARANAL” ;
                :config_large_scale_forcing_scale = “300 km” ;
                :config_large_scale_forcing_specifics = “VARANARAP LAND” ;
                :config_surface_treatment = “VARANAL” ;
                :config_surface_treatment_specifics = “VARANARAP LAND” ;
                :config_initial_condition = “SONDE” ;
                :config_initial_condition_specifics = “SONDE” ;
                :config_aerosol = “constant” ;
                :config_forecast_time = “15 hours” ;
                :config_boundary_method = “periodic” ;
                :config_microphysics = “Morrison” ;
                :config_nickname = “runlas150606aguvar1” ;
                :config_comments = “AGU run; contains random number seed repetition feature in initial conditions (minimal
impact to clouds)” ;
                :boundary_layer_top = “ “ ;
                :boundary_layer_bottom = “ “ ;
                :contacts = “William.Gustafson@pnnl.gov, Vogelmann@bnl.gov” ;
                :doi = “10.5439/1256454” ;
                :history = “Thu Jun 23 01:28:52 2016” ;
}
```

File: .../20150606/sim0001/raw_model/wrfout_d01_2015-06-06_12:00:00.nc

Description: WRF output with instantaneous variables for the full domain.

```
netcdf wrfout_d01_2015-06-06_12\:00\:00 {
dimensions:
        Time = UNLIMITED ; // (4 currently)
        south_north = 256 ;
        west_east = 256 ;
        bottom_top = 336 ;
        soil_layers_stag = 5 ;
        force_layers = 751 ;
        west_east_stag = 257 ;
        south_north_stag = 257 ;
        bottom_top_stag = 337 ;
        DateStrLen = 19 ;
variables:
        double ACGRDFLX(Time, south_north, west_east) ;
                ACGRDFLX:FieldType = 105 ;
                ACGRDFLX:MemoryOrder = “XY “ ;
                ACGRDFLX:description = “ACCUMULATED GROUND HEAT FLUX” ;
```

```
                ACGRDFLX:units = “J m-2” ;
                ACGRDFLX:stagger = “” ;
                ACGRDFLX:coordinates = “XLONG XLAT XTIME” ;
        double ACHFX(Time, south_north, west_east) ;
                ACHFX:FieldType = 105 ;
                ACHFX:MemoryOrder = “XY “ ;
                ACHFX:description = “ACCUMULATED UPWARD HEAT FLUX AT THE SURFACE” ;
                ACHFX:units = “J m-2” ;
                ACHFX:stagger = “” ;
                ACHFX:coordinates = “XLONG XLAT XTIME” ;
        double ACLHF(Time, south_north, west_east) ;
                ACLHF:FieldType = 105 ;
                ACLHF:MemoryOrder = “XY “ ;
                ACLHF:description = “ACCUMULATED UPWARD LATENT HEAT FLUX AT THE SURFACE” ;
                ACLHF:units = “J m-2” ;
                ACLHF:stagger = “” ;
                ACLHF:coordinates = “XLONG XLAT XTIME” ;
        double ACLWDNB(Time, south_north, west_east) ;
                ACLWDNB:FieldType = 105 ;
                ACLWDNB:MemoryOrder = “XY “ ;
                ACLWDNB:description = “ACCUMULATED DOWNWELLING LONGWAVE FLUX AT BOTTOM” ;
                ACLWDNB:units = “J m-2” ;
                ACLWDNB:stagger = “” ;
                ACLWDNB:coordinates = “XLONG XLAT XTIME” ;
        double ACLWDNBC(Time, south_north, west_east) ;
                ACLWDNBC:FieldType = 105 ;
                ACLWDNBC:MemoryOrder = “XY “ ;
                ACLWDNBC:description = “ACCUMULATED DOWNWELLING CLEAR SKY LONGWAVE FLUX AT
BOTTOM” ;
                ACLWDNBC:units = “J m-2” ;
                ACLWDNBC:stagger = “” ;
                ACLWDNBC:coordinates = “XLONG XLAT XTIME” ;
        double ACLWDNT(Time, south_north, west_east) ;
                ACLWDNT:FieldType = 105 ;
                ACLWDNT:MemoryOrder = “XY “ ;
                ACLWDNT:description = “ACCUMULATED DOWNWELLING LONGWAVE FLUX AT TOP” ;
                ACLWDNT:units = “J m-2” ;
                ACLWDNT:stagger = “” ;
                ACLWDNT:coordinates = “XLONG XLAT XTIME” ;
        double ACLWDNTC(Time, south_north, west_east) ;
                ACLWDNTC:FieldType = 105 ;
                ACLWDNTC:MemoryOrder = “XY “ ;
                ACLWDNTC:description = “ACCUMULATED DOWNWELLING CLEAR SKY LONGWAVE FLUX AT
TOP” ;
                ACLWDNTC:units = “J m-2” ;
                ACLWDNTC:stagger = “” ;
                ACLWDNTC:coordinates = “XLONG XLAT XTIME” ;
        double ACLWUPB(Time, south_north, west_east) ;
                ACLWUPB:FieldType = 105 ;
                ACLWUPB:MemoryOrder = “XY “ ;
                ACLWUPB:description = “ACCUMULATED UPWELLING LONGWAVE FLUX AT BOTTOM” ;
                ACLWUPB:units = “J m-2” ;
                ACLWUPB:stagger = “” ;
                ACLWUPB:coordinates = “XLONG XLAT XTIME” ;
        double ACLWUPBC(Time, south_north, west_east) ;
                ACLWUPBC:FieldType = 105 ;
                ACLWUPBC:MemoryOrder = “XY “ ;
                ACLWUPBC:description = “ACCUMULATED UPWELLING CLEAR SKY LONGWAVE FLUX AT BOT-
TOM” ;
                ACLWUPBC:units = “J m-2” ;
                ACLWUPBC:stagger = “” ;
                ACLWUPBC:coordinates = “XLONG XLAT XTIME” ;
```

double ACLWUPT(Time, south_north, west_east) ;
ACLWUPT:FieldType = 105 ;
ACLWUPT:MemoryOrder = “XY “ ;
ACLWUPT:description = “ACCUMULATED UPWELLING LONGWAVE FLUX AT TOP” ;
ACLWUPT:units = “J m-2” ;
ACLWUPT:stagger = “” ;
ACLWUPT:coordinates = “XLONG XLAT XTIME” ;
double ACLWUPTC(Time, south_north, west_east) ;
ACLWUPTC:FieldType = 105 ;
ACLWUPTC:MemoryOrder = “XY “ ;
ACLWUPTC:description = “ACCUMULATED UPWELLING CLEAR SKY LONGWAVE FLUX AT TOP” ;
ACLWUPTC:units = “J m-2” ;
ACLWUPTC:stagger = “” ;
ACLWUPTC:coordinates = “XLONG XLAT XTIME” ;
double ACSNOM(Time, south_north, west_east) ;
ACSNOM:FieldType = 105 ;
ACSNOM:MemoryOrder = “XY “ ;
ACSNOM:description = “ACCUMULATED MELTED SNOW” ;
ACSNOM:units = “kg m-2” ;
ACSNOM:stagger = “” ;
ACSNOM:coordinates = “XLONG XLAT XTIME” ;
double ACSWDNB(Time, south_north, west_east) ;
ACSWDNB:FieldType = 105 ;
ACSWDNB:MemoryOrder = “XY “ ;
ACSWDNB:description = “ACCUMULATED DOWNWELLING SHORTWAVE FLUX AT BOTTOM” ;
ACSWDNB:units = “J m-2” ;
ACSWDNB:stagger = “” ;
ACSWDNB:coordinates = “XLONG XLAT XTIME” ;
double ACSWDNBC(Time, south_north, west_east) ;
ACSWDNBC:FieldType = 105 ;
ACSWDNBC:MemoryOrder = “XY “ ;
ACSWDNBC:description = “ACCUMULATED DOWNWELLING CLEAR SKY SHORTWAVE FLUX AT BOTTOM” ;
ACSWDNBC:units = “J m-2” ;
ACSWDNBC:stagger = “” ;
ACSWDNBC:coordinates = “XLONG XLAT XTIME” ;
double ACSWDNT(Time, south_north, west_east) ;
ACSWDNT:FieldType = 105 ;
ACSWDNT:MemoryOrder = “XY “ ;
ACSWDNT:description = “ACCUMULATED DOWNWELLING SHORTWAVE FLUX AT TOP” ;
ACSWDNT:units = “J m-2” ;
ACSWDNT:stagger = “” ;
ACSWDNT:coordinates = “XLONG XLAT XTIME” ;
double ACSWDNTC(Time, south_north, west_east) ;
ACSWDNTC:FieldType = 105 ;
ACSWDNTC:MemoryOrder = “XY “ ;
ACSWDNTC:description = “ACCUMULATED DOWNWELLING CLEAR SKY SHORTWAVE FLUX AT TOP” ;
ACSWDNTC:units = “J m-2” ;
ACSWDNTC:stagger = “” ;
ACSWDNTC:coordinates = “XLONG XLAT XTIME” ;
double ACSWUPB(Time, south_north, west_east) ;
ACSWUPB:FieldType = 105 ;
ACSWUPB:MemoryOrder = “XY “ ;
ACSWUPB:description = “ACCUMULATED UPWELLING SHORTWAVE FLUX AT BOTTOM” ;
ACSWUPB:units = “J m-2” ;
ACSWUPB:stagger = “” ;
ACSWUPB:coordinates = “XLONG XLAT XTIME” ;
double ACSWUPBC(Time, south_north, west_east) ;
ACSWUPBC:FieldType = 105 ;
ACSWUPBC:MemoryOrder = “XY “ ;
ACSWUPBC:description = “ACCUMULATED UPWELLING CLEAR SKY SHORTWAVE FLUX AT BOT-

```
TOM" ;
                ACSWUPBC:units = "J m-2" ;
                ACSWUPBC:stagger = "" ;
                ACSWUPBC:coordinates = "XLONG XLAT XTIME" ;
        double ACSWUPT(Time, south_north, west_east) ;
                ACSWUPT:FieldType = 105 ;
                ACSWUPT:MemoryOrder = "XY " ;
                ACSWUPT:description = "ACCUMULATED UPWELLING SHORTWAVE FLUX AT TOP" ;
                ACSWUPT:units = "J m-2" ;
                ACSWUPT:stagger = "" ;
                ACSWUPT:coordinates = "XLONG XLAT XTIME" ;
        double ACSWUPTC(Time, south_north, west_east) ;
                ACSWUPTC:FieldType = 105 ;
                ACSWUPTC:MemoryOrder = "XY " ;
                ACSWUPTC:description = "ACCUMULATED UPWELLING CLEAR SKY SHORTWAVE FLUX AT TOP" ;
                ACSWUPTC:units = "J m-2" ;
                ACSWUPTC:stagger = "" ;
                ACSWUPTC:coordinates = "XLONG XLAT XTIME" ;
        double ALBBCK(Time, south_north, west_east) ;
                ALBBCK:FieldType = 105 ;
                ALBBCK:MemoryOrder = "XY " ;
                ALBBCK:description = "BACKGROUND ALBEDO" ;
                ALBBCK:units = "" ;
                ALBBCK:stagger = "" ;
                ALBBCK:coordinates = "XLONG XLAT XTIME" ;
        double ALBEDO(Time, south_north, west_east) ;
                ALBEDO:FieldType = 105 ;
                ALBEDO:MemoryOrder = "XY " ;
                ALBEDO:description = "ALBEDO" ;
                ALBEDO:units = "-" ;
                ALBEDO:stagger = "" ;
                ALBEDO:coordinates = "XLONG XLAT XTIME" ;
        double CANWAT(Time, south_north, west_east) ;
                CANWAT:FieldType = 105 ;
                CANWAT:MemoryOrder = "XY " ;
                CANWAT:description = "CANOPY WATER" ;
                CANWAT:units = "kg m-2" ;
                CANWAT:stagger = "" ;
                CANWAT:coordinates = "XLONG XLAT XTIME" ;
        double CF1(Time) ;
                CF1:FieldType = 105 ;
                CF1:MemoryOrder = "0  " ;
                CF1:description = "2nd order extrapolation constant" ;
                CF1:units = "" ;
                CF1:stagger = "" ;
        double CF2(Time) ;
                CF2:FieldType = 105 ;
                CF2:MemoryOrder = "0  " ;
                CF2:description = "2nd order extrapolation constant" ;
                CF2:units = "" ;
                CF2:stagger = "" ;
        double CF3(Time) ;
                CF3:FieldType = 105 ;
                CF3:MemoryOrder = "0  " ;
                CF3:description = "2nd order extrapolation constant" ;
                CF3:units = "" ;
                CF3:stagger = "" ;
        double CFN(Time) ;
                CFN:FieldType = 105 ;
                CFN:MemoryOrder = "0  " ;
                CFN:description = "extrapolation constant" ;
                CFN:units = "" ;
```

```
        CFN:stagger = “” ;
double CFN1(Time) ;
        CFN1:FieldType = 105 ;
        CFN1:MemoryOrder = “0  “ ;
        CFN1:description = “extrapolation constant” ;
        CFN1:units = “” ;
        CFN1:stagger = “” ;
double CLAT(Time, south_north, west_east) ;
        CLAT:FieldType = 105 ;
        CLAT:MemoryOrder = “XY “ ;
        CLAT:description = “COMPUTATIONAL GRID LATITUDE, SOUTH IS NEGATIVE” ;
        CLAT:units = “degree_north” ;
        CLAT:stagger = “” ;
        CLAT:coordinates = “XLONG XLAT XTIME” ;
double CLDFRA(Time, bottom_top, south_north, west_east) ;
        CLDFRA:FieldType = 105 ;
        CLDFRA:MemoryOrder = “XYZ” ;
        CLDFRA:description = “CLOUD FRACTION” ;
        CLDFRA:units = “” ;
        CLDFRA:stagger = “” ;
        CLDFRA:coordinates = “XLONG XLAT XTIME” ;
double COSALPHA(Time, south_north, west_east) ;
        COSALPHA:FieldType = 105 ;
        COSALPHA:MemoryOrder = “XY “ ;
        COSALPHA:description = “Local cosine of map rotation” ;
        COSALPHA:units = “” ;
        COSALPHA:stagger = “” ;
        COSALPHA:coordinates = “XLONG XLAT XTIME” ;
double COSZEN(Time, south_north, west_east) ;
        COSZEN:FieldType = 105 ;
        COSZEN:MemoryOrder = “XY “ ;
        COSZEN:description = “COS of SOLAR ZENITH ANGLE” ;
        COSZEN:units = “dimensionless” ;
        COSZEN:stagger = “” ;
        COSZEN:coordinates = “XLONG XLAT XTIME” ;
double DIFFUSE_FRAC(Time, south_north, west_east) ;
        DIFFUSE_FRAC:FieldType = 105 ;
        DIFFUSE_FRAC:MemoryOrder = “XY “ ;
        DIFFUSE_FRAC:description = “DIFFUSE FRACTION OF SURFACE SHORTWAVE IRRADIANCE” ;
        DIFFUSE_FRAC:units = “” ;
        DIFFUSE_FRAC:stagger = “” ;
        DIFFUSE_FRAC:coordinates = “XLONG XLAT XTIME” ;
double DN(Time, bottom_top) ;
        DN:FieldType = 105 ;
        DN:MemoryOrder = “Z  “ ;
        DN:description = “d(eta) values between half (mass) levels” ;
        DN:units = “” ;
        DN:stagger = “” ;
double DNW(Time, bottom_top) ;
        DNW:FieldType = 105 ;
        DNW:MemoryOrder = “Z  “ ;
        DNW:description = “d(eta) values between full (w) levels” ;
        DNW:units = “” ;
        DNW:stagger = “” ;
double DZS(Time, soil_layers_stag) ;
        DZS:FieldType = 105 ;
        DZS:MemoryOrder = “Z  “ ;
        DZS:description = “THICKNESSES OF SOIL LAYERS” ;
        DZS:units = “m” ;
        DZS:stagger = “Z” ;
double E(Time, south_north, west_east) ;
        E:FieldType = 105 ;
```

```
            E:MemoryOrder = "XY " ;
            E:description = "Coriolis cosine latitude term" ;
            E:units = "s-1" ;
            E:stagger = "" ;
            E:coordinates = "XLONG XLAT XTIME" ;
double EFFCS(Time, bottom_top, south_north, west_east) ;
            EFFCS:FieldType = 105 ;
            EFFCS:MemoryOrder = "XYZ" ;
            EFFCS:description = "CLOUD DROPLET EFFECTIVE RADIUS" ;
            EFFCS:units = "micron" ;
            EFFCS:stagger = "" ;
            EFFCS:coordinates = "XLONG XLAT XTIME" ;
double EMISS(Time, south_north, west_east) ;
            EMISS:FieldType = 105 ;
            EMISS:MemoryOrder = "XY " ;
            EMISS:description = "SURFACE EMISSIVITY" ;
            EMISS:units = "" ;
            EMISS:stagger = "" ;
            EMISS:coordinates = "XLONG XLAT XTIME" ;
double F(Time, south_north, west_east) ;
            F:FieldType = 105 ;
            F:MemoryOrder = "XY " ;
            F:description = "Coriolis sine latitude term" ;
            F:units = "s-1" ;
            F:stagger = "" ;
            F:coordinates = "XLONG XLAT XTIME" ;
double FNM(Time, bottom_top) ;
            FNM:FieldType = 105 ;
            FNM:MemoryOrder = "Z  " ;
            FNM:description = "upper weight for vertical stretching" ;
            FNM:units = "" ;
            FNM:stagger = "" ;
double FNP(Time, bottom_top) ;
            FNP:FieldType = 105 ;
            FNP:MemoryOrder = "Z  " ;
            FNP:description = "lower weight for vertical stretching" ;
            FNP:units = "" ;
            FNP:stagger = "" ;
double GLW(Time, south_north, west_east) ;
            GLW:FieldType = 105 ;
            GLW:MemoryOrder = "XY " ;
            GLW:description = "DOWNWARD LONG WAVE FLUX AT GROUND SURFACE" ;
            GLW:units = "W m-2" ;
            GLW:stagger = "" ;
            GLW:coordinates = "XLONG XLAT XTIME" ;
double GRAUPELNC(Time, south_north, west_east) ;
            GRAUPELNC:FieldType = 105 ;
            GRAUPELNC:MemoryOrder = "XY " ;
            GRAUPELNC:description = "ACCUMULATED TOTAL GRID SCALE GRAUPEL" ;
            GRAUPELNC:units = "mm" ;
            GRAUPELNC:stagger = "" ;
            GRAUPELNC:coordinates = "XLONG XLAT XTIME" ;
double GRDFLX(Time, south_north, west_east) ;
            GRDFLX:FieldType = 105 ;
            GRDFLX:MemoryOrder = "XY " ;
            GRDFLX:description = "GROUND HEAT FLUX" ;
            GRDFLX:units = "W m-2" ;
            GRDFLX:stagger = "" ;
            GRDFLX:coordinates = "XLONG XLAT XTIME" ;
double HAILNC(Time, south_north, west_east) ;
            HAILNC:FieldType = 105 ;
            HAILNC:MemoryOrder = "XY " ;
```

```
        HAILNC:description = "ACCUMULATED TOTAL GRID SCALE HAIL" ;
        HAILNC:units = "mm" ;
        HAILNC:stagger = "" ;
        HAILNC:coordinates = "XLONG XLAT XTIME" ;
double HFX(Time, south_north, west_east) ;
        HFX:FieldType = 105 ;
        HFX:MemoryOrder = "XY " ;
        HFX:description = "UPWARD HEAT FLUX AT THE SURFACE" ;
        HFX:units = "W m-2" ;
        HFX:stagger = "" ;
        HFX:coordinates = "XLONG XLAT XTIME" ;
double HFX_FORCE(Time) ;
        HFX_FORCE:FieldType = 105 ;
        HFX_FORCE:MemoryOrder = "0  " ;
        HFX_FORCE:description = "SCM ideal surface sensible heat flux" ;
        HFX_FORCE:units = "W m-2" ;
        HFX_FORCE:stagger = "" ;
double HFX_FORCE_TEND(Time) ;
        HFX_FORCE_TEND:FieldType = 105 ;
        HFX_FORCE_TEND:MemoryOrder = "0  " ;
        HFX_FORCE_TEND:description = "SCM ideal surface sensible heat flux tendency" ;
        HFX_FORCE_TEND:units = "W m-2 s-1" ;
        HFX_FORCE_TEND:stagger = "" ;
double HGT(Time, south_north, west_east) ;
        HGT:FieldType = 105 ;
        HGT:MemoryOrder = "XY " ;
        HGT:description = "Terrain Height" ;
        HGT:units = "m" ;
        HGT:stagger = "" ;
        HGT:coordinates = "XLONG XLAT XTIME" ;
double INV_TAU_M(Time, force_layers) ;
        INV_TAU_M:FieldType = 105 ;
        INV_TAU_M:MemoryOrder = "Z  " ;
        INV_TAU_M:description = "inverse relaxation time for scalars" ;
        INV_TAU_M:units = "s-1" ;
        INV_TAU_M:stagger = "" ;
double INV_TAU_S(Time, force_layers) ;
        INV_TAU_S:FieldType = 105 ;
        INV_TAU_S:MemoryOrder = "Z  " ;
        INV_TAU_S:description = "inverse relaxation time for scalars" ;
        INV_TAU_S:units = "s-1" ;
        INV_TAU_S:stagger = "" ;
int ISEEDARR_RAND_PERTURB(Time, bottom_top) ;
        ISEEDARR_RAND_PERTURB:FieldType = 106 ;
        ISEEDARR_RAND_PERTURB:MemoryOrder = "Z  " ;
        ISEEDARR_RAND_PERTURB:description = "Array to hold seed for restart, RAND_PERT" ;
        ISEEDARR_RAND_PERTURB:units = "" ;
        ISEEDARR_RAND_PERTURB:stagger = "" ;
int ISEEDARR_SKEBS(Time, bottom_top) ;
        ISEEDARR_SKEBS:FieldType = 106 ;
        ISEEDARR_SKEBS:MemoryOrder = "Z  " ;
        ISEEDARR_SKEBS:description = "Array to hold seed for restart, SKEBS" ;
        ISEEDARR_SKEBS:units = "" ;
        ISEEDARR_SKEBS:stagger = "" ;
int ISEEDARR_SPPT(Time, bottom_top) ;
        ISEEDARR_SPPT:FieldType = 106 ;
        ISEEDARR_SPPT:MemoryOrder = "Z  " ;
        ISEEDARR_SPPT:description = "Array to hold seed for restart, SPPT" ;
        ISEEDARR_SPPT:units = "" ;
        ISEEDARR_SPPT:stagger = "" ;
int ISLTYP(Time, south_north, west_east) ;
        ISLTYP:FieldType = 106 ;
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                ISLTYP:MemoryOrder = “XY “ ;
                ISLTYP:description = “DOMINANT SOIL CATEGORY” ;
                ISLTYP:units = “” ;
                ISLTYP:stagger = “” ;
                ISLTYP:coordinates = “XLONG XLAT XTIME” ;
        int ITIMESTEP(Time) ;
                ITIMESTEP:FieldType = 106 ;
                ITIMESTEP:MemoryOrder = “0  “ ;
                ITIMESTEP:description = “” ;
                ITIMESTEP:units = “” ;
                ITIMESTEP:stagger = “” ;
        int IVGTYP(Time, south_north, west_east) ;
                IVGTYP:FieldType = 106 ;
                IVGTYP:MemoryOrder = “XY “ ;
                IVGTYP:description = “DOMINANT VEGETATION CATEGORY” ;
                IVGTYP:units = “” ;
                IVGTYP:stagger = “” ;
                IVGTYP:coordinates = “XLONG XLAT XTIME” ;
        int I_ACLWDNB(Time, south_north, west_east) ;
                I_ACLWDNB:FieldType = 106 ;
                I_ACLWDNB:MemoryOrder = “XY “ ;
                I_ACLWDNB:description = “BUCKET FOR DOWNWELLING LONGWAVE FLUX AT BOTTOM” ;
                I_ACLWDNB:units = “J m-2” ;
                I_ACLWDNB:stagger = “” ;
                I_ACLWDNB:coordinates = “XLONG XLAT XTIME” ;
        int I_ACLWDNBC(Time, south_north, west_east) ;
                I_ACLWDNBC:FieldType = 106 ;
                I_ACLWDNBC:MemoryOrder = “XY “ ;
                I_ACLWDNBC:description = “BUCKET FOR DOWNWELLING CLEAR SKY LONGWAVE FLUX AT
BOTTOM” ;
                I_ACLWDNBC:units = “J m-2” ;
                I_ACLWDNBC:stagger = “” ;
                I_ACLWDNBC:coordinates = “XLONG XLAT XTIME” ;
        int I_ACLWDNT(Time, south_north, west_east) ;
                I_ACLWDNT:FieldType = 106 ;
                I_ACLWDNT:MemoryOrder = “XY “ ;
                I_ACLWDNT:description = “BUCKET FOR DOWNWELLING LONGWAVE FLUX AT TOP” ;
                I_ACLWDNT:units = “J m-2” ;
                I_ACLWDNT:stagger = “” ;
                I_ACLWDNT:coordinates = “XLONG XLAT XTIME” ;
        int I_ACLWDNTC(Time, south_north, west_east) ;
                I_ACLWDNTC:FieldType = 106 ;
                I_ACLWDNTC:MemoryOrder = “XY “ ;
                I_ACLWDNTC:description = “BUCKET FOR DOWNWELLING CLEAR SKY LONGWAVE FLUX AT
TOP” ;
                I_ACLWDNTC:units = “J m-2” ;
                I_ACLWDNTC:stagger = “” ;
                I_ACLWDNTC:coordinates = “XLONG XLAT XTIME” ;
        int I_ACLWUPB(Time, south_north, west_east) ;
                I_ACLWUPB:FieldType = 106 ;
                I_ACLWUPB:MemoryOrder = “XY “ ;
                I_ACLWUPB:description = “BUCKET FOR UPWELLING LONGWAVE FLUX AT BOTTOM” ;
                I_ACLWUPB:units = “J m-2” ;
                I_ACLWUPB:stagger = “” ;
                I_ACLWUPB:coordinates = “XLONG XLAT XTIME” ;
        int I_ACLWUPBC(Time, south_north, west_east) ;
                I_ACLWUPBC:FieldType = 106 ;
                I_ACLWUPBC:MemoryOrder = “XY “ ;
                I_ACLWUPBC:description = “BUCKET FOR UPWELLING CLEAR SKY LONGWAVE FLUX AT BOT-
TOM” ;
                I_ACLWUPBC:units = “J m-2” ;
                I_ACLWUPBC:stagger = “” ;
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                I_ACLWUPBC:coordinates = “XLONG XLAT XTIME” ;
        int I_ACLWUPT(Time, south_north, west_east) ;
                I_ACLWUPT:FieldType = 106 ;
                I_ACLWUPT:MemoryOrder = “XY “ ;
                I_ACLWUPT:description = “BUCKET FOR UPWELLING LONGWAVE FLUX AT TOP” ;
                I_ACLWUPT:units = “J m-2” ;
                I_ACLWUPT:stagger = “” ;
                I_ACLWUPT:coordinates = “XLONG XLAT XTIME” ;
        int I_ACLWUPTC(Time, south_north, west_east) ;
                I_ACLWUPTC:FieldType = 106 ;
                I_ACLWUPTC:MemoryOrder = “XY “ ;
                I_ACLWUPTC:description = “BUCKET FOR UPWELLING CLEAR SKY LONGWAVE FLUX AT TOP” ;
                I_ACLWUPTC:units = “J m-2” ;
                I_ACLWUPTC:stagger = “” ;
                I_ACLWUPTC:coordinates = “XLONG XLAT XTIME” ;
        int I_ACSWDNB(Time, south_north, west_east) ;
                I_ACSWDNB:FieldType = 106 ;
                I_ACSWDNB:MemoryOrder = “XY “ ;
                I_ACSWDNB:description = “BUCKET FOR DOWNWELLING SHORTWAVE FLUX AT BOTTOM” ;
                I_ACSWDNB:units = “J m-2” ;
                I_ACSWDNB:stagger = “” ;
                I_ACSWDNB:coordinates = “XLONG XLAT XTIME” ;
        int I_ACSWDNBC(Time, south_north, west_east) ;
                I_ACSWDNBC:FieldType = 106 ;
                I_ACSWDNBC:MemoryOrder = “XY “ ;
                I_ACSWDNBC:description = “BUCKET FOR DOWNWELLING CLEAR SKY SHORTWAVE FLUX AT
BOTTOM” ;
                I_ACSWDNBC:units = “J m-2” ;
                I_ACSWDNBC:stagger = “” ;
                I_ACSWDNBC:coordinates = “XLONG XLAT XTIME” ;
        int I_ACSWDNT(Time, south_north, west_east) ;
                I_ACSWDNT:FieldType = 106 ;
                I_ACSWDNT:MemoryOrder = “XY “ ;
                I_ACSWDNT:description = “BUCKET FOR DOWNWELLING SHORTWAVE FLUX AT TOP” ;
                I_ACSWDNT:units = “J m-2” ;
                I_ACSWDNT:stagger = “” ;
                I_ACSWDNT:coordinates = “XLONG XLAT XTIME” ;
        int I_ACSWDNTC(Time, south_north, west_east) ;
                I_ACSWDNTC:FieldType = 106 ;
                I_ACSWDNTC:MemoryOrder = “XY “ ;
                I_ACSWDNTC:description = “BUCKET FOR DOWNWELLING CLEAR SKY SHORTWAVE FLUX AT
TOP” ;
                I_ACSWDNTC:units = “J m-2” ;
                I_ACSWDNTC:stagger = “” ;
                I_ACSWDNTC:coordinates = “XLONG XLAT XTIME” ;
        int I_ACSWUPB(Time, south_north, west_east) ;
                I_ACSWUPB:FieldType = 106 ;
                I_ACSWUPB:MemoryOrder = “XY “ ;
                I_ACSWUPB:description = “BUCKET FOR UPWELLING SHORTWAVE FLUX AT BOTTOM” ;
                I_ACSWUPB:units = “J m-2” ;
                I_ACSWUPB:stagger = “” ;
                I_ACSWUPB:coordinates = “XLONG XLAT XTIME” ;
        int I_ACSWUPBC(Time, south_north, west_east) ;
                I_ACSWUPBC:FieldType = 106 ;
                I_ACSWUPBC:MemoryOrder = “XY “ ;
                I_ACSWUPBC:description = “BUCKET FOR UPWELLING CLEAR SKY SHORTWAVE FLUX AT BOT-
TOM” ;
                I_ACSWUPBC:units = “J m-2” ;
                I_ACSWUPBC:stagger = “” ;
                I_ACSWUPBC:coordinates = “XLONG XLAT XTIME” ;
        int I_ACSWUPT(Time, south_north, west_east) ;
                I_ACSWUPT:FieldType = 106 ;
```

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            I_ACSWUPT:MemoryOrder = “XY “ ;
            I_ACSWUPT:description = “BUCKET FOR UPWELLING SHORTWAVE FLUX AT TOP” ;
            I_ACSWUPT:units = “J m-2” ;
            I_ACSWUPT:stagger = “” ;
            I_ACSWUPT:coordinates = “XLONG XLAT XTIME” ;
int I_ACSWUPTC(Time, south_north, west_east) ;
            I_ACSWUPTC:FieldType = 106 ;
            I_ACSWUPTC:MemoryOrder = “XY “ ;
            I_ACSWUPTC:description = “BUCKET FOR UPWELLING CLEAR SKY SHORTWAVE FLUX AT TOP” ;
            I_ACSWUPTC:units = “J m-2” ;
            I_ACSWUPTC:stagger = “” ;
            I_ACSWUPTC:coordinates = “XLONG XLAT XTIME” ;
double LAI(Time, south_north, west_east) ;
            LAI:FieldType = 105 ;
            LAI:MemoryOrder = “XY “ ;
            LAI:description = “LEAF AREA INDEX” ;
            LAI:units = “m-2/m-2” ;
            LAI:stagger = “” ;
            LAI:coordinates = “XLONG XLAT XTIME” ;
double LAKEMASK(Time, south_north, west_east) ;
            LAKEMASK:FieldType = 105 ;
            LAKEMASK:MemoryOrder = “XY “ ;
            LAKEMASK:description = “LAKE MASK (1 FOR LAKE, 0 FOR NON-LAKE)” ;
            LAKEMASK:units = “” ;
            LAKEMASK:stagger = “” ;
            LAKEMASK:coordinates = “XLONG XLAT XTIME” ;
double LANDMASK(Time, south_north, west_east) ;
            LANDMASK:FieldType = 105 ;
            LANDMASK:MemoryOrder = “XY “ ;
            LANDMASK:description = “LAND MASK (1 FOR LAND, 0 FOR WATER)” ;
            LANDMASK:units = “” ;
            LANDMASK:stagger = “” ;
            LANDMASK:coordinates = “XLONG XLAT XTIME” ;
double LAP_HGT(Time, south_north, west_east) ;
            LAP_HGT:FieldType = 105 ;
            LAP_HGT:MemoryOrder = “XY “ ;
            LAP_HGT:description = “Laplacian of orography” ;
            LAP_HGT:units = “m” ;
            LAP_HGT:stagger = “” ;
            LAP_HGT:coordinates = “XLONG XLAT XTIME” ;
double LH(Time, south_north, west_east) ;
            LH:FieldType = 105 ;
            LH:MemoryOrder = “XY “ ;
            LH:description = “LATENT HEAT FLUX AT THE SURFACE” ;
            LH:units = “W m-2” ;
            LH:stagger = “” ;
            LH:coordinates = “XLONG XLAT XTIME” ;
double LH_FORCE(Time) ;
            LH_FORCE:FieldType = 105 ;
            LH_FORCE:MemoryOrder = “0  “ ;
            LH_FORCE:description = “SCM ideal surface latent heat flux” ;
            LH_FORCE:units = “W m-2” ;
            LH_FORCE:stagger = “” ;
double LH_FORCE_TEND(Time) ;
            LH_FORCE_TEND:FieldType = 105 ;
            LH_FORCE_TEND:MemoryOrder = “0  “ ;
            LH_FORCE_TEND:description = “SCM ideal surface latent heat flux tendency” ;
            LH_FORCE_TEND:units = “W m-2 s-1” ;
            LH_FORCE_TEND:stagger = “” ;
double LU_INDEX(Time, south_north, west_east) ;
            LU_INDEX:FieldType = 105 ;
            LU_INDEX:MemoryOrder = “XY “ ;
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                LU_INDEX:description = “LAND USE CATEGORY” ;
                LU_INDEX:units = “” ;
                LU_INDEX:stagger = “” ;
                LU_INDEX:coordinates = “XLONG XLAT XTIME” ;
        double LWDNB(Time, south_north, west_east) ;
                LWDNB:FieldType = 105 ;
                LWDNB:MemoryOrder = “XY “ ;
                LWDNB:description = “INSTANTANEOUS DOWNWELLING LONGWAVE FLUX AT BOTTOM” ;
                LWDNB:units = “W m-2” ;
                LWDNB:stagger = “” ;
                LWDNB:coordinates = “XLONG XLAT XTIME” ;
        double LWDNBC(Time, south_north, west_east) ;
                LWDNBC:FieldType = 105 ;
                LWDNBC:MemoryOrder = “XY “ ;
                LWDNBC:description = “INSTANTANEOUS DOWNWELLING CLEAR SKY LONGWAVE FLUX AT
BOTTOM” ;
                LWDNBC:units = “W m-2” ;
                LWDNBC:stagger = “” ;
                LWDNBC:coordinates = “XLONG XLAT XTIME” ;
        double LWDNFD(Time, bottom_top, south_north, west_east) ;
                LWDNFD:FieldType = 105 ;
                LWDNFD:MemoryOrder = “XYZ” ;
                LWDNFD:description = “LW downward flux in model domain” ;
                LWDNFD:units = “” ;
                LWDNFD:stagger = “” ;
                LWDNFD:coordinates = “XLONG XLAT XTIME” ;
        double LWDNT(Time, south_north, west_east) ;
                LWDNT:FieldType = 105 ;
                LWDNT:MemoryOrder = “XY “ ;
                LWDNT:description = “INSTANTANEOUS DOWNWELLING LONGWAVE FLUX AT TOP” ;
                LWDNT:units = “W m-2” ;
                LWDNT:stagger = “” ;
                LWDNT:coordinates = “XLONG XLAT XTIME” ;
        double LWDNTC(Time, south_north, west_east) ;
                LWDNTC:FieldType = 105 ;
                LWDNTC:MemoryOrder = “XY “ ;
                LWDNTC:description = “INSTANTANEOUS DOWNWELLING CLEAR SKY LONGWAVE FLUX AT
TOP” ;
                LWDNTC:units = “W m-2” ;
                LWDNTC:stagger = “” ;
                LWDNTC:coordinates = “XLONG XLAT XTIME” ;
        double LWF0(Time, bottom_top, south_north, west_east) ;
                LWF0:FieldType = 105 ;
                LWF0:MemoryOrder = “XYZ” ;
                LWF0:description = “Net LW radiative flux” ;
                LWF0:units = “W m-2” ;
                LWF0:stagger = “” ;
                LWF0:coordinates = “XLONG XLAT XTIME” ;
        double LWF1(Time, bottom_top, south_north, west_east) ;
                LWF1:FieldType = 105 ;
                LWF1:MemoryOrder = “XYZ” ;
                LWF1:description = “Net LW radiative flux, term1” ;
                LWF1:units = “W m-2” ;
                LWF1:stagger = “” ;
                LWF1:coordinates = “XLONG XLAT XTIME” ;
        double LWF2(Time, bottom_top, south_north, west_east) ;
                LWF2:FieldType = 105 ;
                LWF2:MemoryOrder = “XYZ” ;
                LWF2:description = “Net LW radiative flux, term2” ;
                LWF2:units = “W m-2” ;
                LWF2:stagger = “” ;
                LWF2:coordinates = “XLONG XLAT XTIME” ;
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double LWF3(Time, bottom_top, south_north, west_east) ;
        LWF3:FieldType = 105 ;
        LWF3:MemoryOrder = “XYZ” ;
        LWF3:description = “Net LW radiative flux, term3” ;
        LWF3:units = “W m-2” ;
        LWF3:stagger = “” ;
        LWF3:coordinates = “XLONG XLAT XTIME” ;
double LWUPB(Time, south_north, west_east) ;
        LWUPB:FieldType = 105 ;
        LWUPB:MemoryOrder = “XY “ ;
        LWUPB:description = “INSTANTANEOUS UPWELLING LONGWAVE FLUX AT BOTTOM” ;
        LWUPB:units = “W m-2” ;
        LWUPB:stagger = “” ;
        LWUPB:coordinates = “XLONG XLAT XTIME” ;
double LWUPBC(Time, south_north, west_east) ;
        LWUPBC:FieldType = 105 ;
        LWUPBC:MemoryOrder = “XY “ ;
        LWUPBC:description = “INSTANTANEOUS UPWELLING CLEAR SKY LONGWAVE FLUX AT BOT-
TOM” ;
        LWUPBC:units = “W m-2” ;
        LWUPBC:stagger = “” ;
        LWUPBC:coordinates = “XLONG XLAT XTIME” ;
double LWUPFD(Time, bottom_top, south_north, west_east) ;
        LWUPFD:FieldType = 105 ;
        LWUPFD:MemoryOrder = “XYZ” ;
        LWUPFD:description = “LW upward flux in model domain” ;
        LWUPFD:units = “” ;
        LWUPFD:stagger = “” ;
        LWUPFD:coordinates = “XLONG XLAT XTIME” ;
double LWUPT(Time, south_north, west_east) ;
        LWUPT:FieldType = 105 ;
        LWUPT:MemoryOrder = “XY “ ;
        LWUPT:description = “INSTANTANEOUS UPWELLING LONGWAVE FLUX AT TOP” ;
        LWUPT:units = “W m-2” ;
        LWUPT:stagger = “” ;
        LWUPT:coordinates = “XLONG XLAT XTIME” ;
double LWUPTC(Time, south_north, west_east) ;
        LWUPTC:FieldType = 105 ;
        LWUPTC:MemoryOrder = “XY “ ;
        LWUPTC:description = “INSTANTANEOUS UPWELLING CLEAR SKY LONGWAVE FLUX AT TOP” ;
        LWUPTC:units = “W m-2” ;
        LWUPTC:stagger = “” ;
        LWUPTC:coordinates = “XLONG XLAT XTIME” ;
double MAPFAC_M(Time, south_north, west_east) ;
        MAPFAC_M:FieldType = 105 ;
        MAPFAC_M:MemoryOrder = “XY “ ;
        MAPFAC_M:description = “Map scale factor on mass grid” ;
        MAPFAC_M:units = “” ;
        MAPFAC_M:stagger = “” ;
        MAPFAC_M:coordinates = “XLONG XLAT XTIME” ;
double MAPFAC_MX(Time, south_north, west_east) ;
        MAPFAC_MX:FieldType = 105 ;
        MAPFAC_MX:MemoryOrder = “XY “ ;
        MAPFAC_MX:description = “Map scale factor on mass grid, x direction” ;
        MAPFAC_MX:units = “” ;
        MAPFAC_MX:stagger = “” ;
        MAPFAC_MX:coordinates = “XLONG XLAT XTIME” ;
double MAPFAC_MY(Time, south_north, west_east) ;
        MAPFAC_MY:FieldType = 105 ;
        MAPFAC_MY:MemoryOrder = “XY “ ;
        MAPFAC_MY:description = “Map scale factor on mass grid, y direction” ;
        MAPFAC_MY:units = “” ;
```

```
        MAPFAC_MY:stagger = “” ;
        MAPFAC_MY:coordinates = “XLONG XLAT XTIME” ;
double MAPFAC_U(Time, south_north, west_east_stag) ;
        MAPFAC_U:FieldType = 105 ;
        MAPFAC_U:MemoryOrder = “XY “ ;
        MAPFAC_U:description = “Map scale factor on u-grid” ;
        MAPFAC_U:units = “” ;
        MAPFAC_U:stagger = “X” ;
        MAPFAC_U:coordinates = “XLONG_U XLAT_U XTIME” ;
double MAPFAC_UX(Time, south_north, west_east_stag) ;
        MAPFAC_UX:FieldType = 105 ;
        MAPFAC_UX:MemoryOrder = “XY “ ;
        MAPFAC_UX:description = “Map scale factor on u-grid, x direction” ;
        MAPFAC_UX:units = “” ;
        MAPFAC_UX:stagger = “X” ;
        MAPFAC_UX:coordinates = “XLONG_U XLAT_U XTIME” ;
double MAPFAC_UY(Time, south_north, west_east_stag) ;
        MAPFAC_UY:FieldType = 105 ;
        MAPFAC_UY:MemoryOrder = “XY “ ;
        MAPFAC_UY:description = “Map scale factor on u-grid, y direction” ;
        MAPFAC_UY:units = “” ;
        MAPFAC_UY:stagger = “X” ;
        MAPFAC_UY:coordinates = “XLONG_U XLAT_U XTIME” ;
double MAPFAC_V(Time, south_north_stag, west_east) ;
        MAPFAC_V:FieldType = 105 ;
        MAPFAC_V:MemoryOrder = “XY “ ;
        MAPFAC_V:description = “Map scale factor on v-grid” ;
        MAPFAC_V:units = “” ;
        MAPFAC_V:stagger = “Y” ;
        MAPFAC_V:coordinates = “XLONG_V XLAT_V XTIME” ;
double MAPFAC_VX(Time, south_north_stag, west_east) ;
        MAPFAC_VX:FieldType = 105 ;
        MAPFAC_VX:MemoryOrder = “XY “ ;
        MAPFAC_VX:description = “Map scale factor on v-grid, x direction” ;
        MAPFAC_VX:units = “” ;
        MAPFAC_VX:stagger = “Y” ;
        MAPFAC_VX:coordinates = “XLONG_V XLAT_V XTIME” ;
double MAPFAC_VY(Time, south_north_stag, west_east) ;
        MAPFAC_VY:FieldType = 105 ;
        MAPFAC_VY:MemoryOrder = “XY “ ;
        MAPFAC_VY:description = “Map scale factor on v-grid, y direction” ;
        MAPFAC_VY:units = “” ;
        MAPFAC_VY:stagger = “Y” ;
        MAPFAC_VY:coordinates = “XLONG_V XLAT_V XTIME” ;
double MAX_MSTFX(Time) ;
        MAX_MSTFX:FieldType = 105 ;
        MAX_MSTFX:MemoryOrder = “0  “ ;
        MAX_MSTFX:description = “Max map factor in domain” ;
        MAX_MSTFX:units = “” ;
        MAX_MSTFX:stagger = “” ;
double MAX_MSTFY(Time) ;
        MAX_MSTFY:FieldType = 105 ;
        MAX_MSTFY:MemoryOrder = “0  “ ;
        MAX_MSTFY:description = “Max map factor in domain” ;
        MAX_MSTFY:units = “” ;
        MAX_MSTFY:stagger = “” ;
double MF_VX_INV(Time, south_north_stag, west_east) ;
        MF_VX_INV:FieldType = 105 ;
        MF_VX_INV:MemoryOrder = “XY “ ;
        MF_VX_INV:description = “Inverse map scale factor on v-grid, x direction” ;
        MF_VX_INV:units = “” ;
        MF_VX_INV:stagger = “Y” ;
```

```
        MF_VX_INV:coordinates = “XLONG_V XLAT_V XTIME” ;
double MU(Time, south_north, west_east) ;
        MU:FieldType = 105 ;
        MU:MemoryOrder = “XY “ ;
        MU:description = “perturbation dry air mass in column” ;
        MU:units = “Pa” ;
        MU:stagger = “” ;
        MU:coordinates = “XLONG XLAT XTIME” ;
double MUB(Time, south_north, west_east) ;
        MUB:FieldType = 105 ;
        MUB:MemoryOrder = “XY “ ;
        MUB:description = “base state dry air mass in column” ;
        MUB:units = “Pa” ;
        MUB:stagger = “” ;
        MUB:coordinates = “XLONG XLAT XTIME” ;
double NEST_POS(Time, south_north, west_east) ;
        NEST_POS:FieldType = 105 ;
        NEST_POS:MemoryOrder = “XY “ ;
        NEST_POS:description = “-” ;
        NEST_POS:units = “-” ;
        NEST_POS:stagger = “” ;
        NEST_POS:coordinates = “XLONG XLAT XTIME” ;
double NOAHRES(Time, south_north, west_east) ;
        NOAHRES:FieldType = 105 ;
        NOAHRES:MemoryOrder = “XY “ ;
        NOAHRES:description = “RESIDUAL OF THE NOAH SURFACE ENERGY BUDGET” ;
        NOAHRES:units = “W m{-2}” ;
        NOAHRES:stagger = “” ;
        NOAHRES:coordinates = “XLONG XLAT XTIME” ;
int NUM_MODES_AER(Time) ;
        NUM_MODES_AER:FieldType = 106 ;
        NUM_MODES_AER:MemoryOrder = “0  “ ;
        NUM_MODES_AER:description = “Number of aerosol distribution modes” ;
        NUM_MODES_AER:units = “” ;
        NUM_MODES_AER:stagger = “” ;
double OLR(Time, south_north, west_east) ;
        OLR:FieldType = 105 ;
        OLR:MemoryOrder = “XY “ ;
        OLR:description = “TOA OUTGOING LONG WAVE” ;
        OLR:units = “W m-2” ;
        OLR:stagger = “” ;
        OLR:coordinates = “XLONG XLAT XTIME” ;
double P(Time, bottom_top, south_north, west_east) ;
        P:FieldType = 105 ;
        P:MemoryOrder = “XYZ” ;
        P:description = “perturbation pressure” ;
        P:units = “Pa” ;
        P:stagger = “” ;
        P:coordinates = “XLONG XLAT XTIME” ;
double P00(Time) ;
        P00:FieldType = 105 ;
        P00:MemoryOrder = “0  “ ;
        P00:description = “BASE STATE PRESURE” ;
        P00:units = “Pa” ;
        P00:stagger = “” ;
double PB(Time, bottom_top, south_north, west_east) ;
        PB:FieldType = 105 ;
        PB:MemoryOrder = “XYZ” ;
        PB:description = “BASE STATE PRESSURE” ;
        PB:units = “Pa” ;
        PB:stagger = “” ;
        PB:coordinates = “XLONG XLAT XTIME” ;
```

```
double PBLH(Time, south_north, west_east) ;
        PBLH:FieldType = 105 ;
        PBLH:MemoryOrder = “XY “ ;
        PBLH:description = “PBL HEIGHT” ;
        PBLH:units = “m” ;
        PBLH:stagger = “” ;
        PBLH:coordinates = “XLONG XLAT XTIME” ;
double PH(Time, bottom_top_stag, south_north, west_east) ;
        PH:FieldType = 105 ;
        PH:MemoryOrder = “XYZ” ;
        PH:description = “perturbation geopotential” ;
        PH:units = “m2 s-2” ;
        PH:stagger = “Z” ;
        PH:coordinates = “XLONG XLAT XTIME” ;
double PHB(Time, bottom_top_stag, south_north, west_east) ;
        PHB:FieldType = 105 ;
        PHB:MemoryOrder = “XYZ” ;
        PHB:description = “base-state geopotential” ;
        PHB:units = “m2 s-2” ;
        PHB:stagger = “Z” ;
        PHB:coordinates = “XLONG XLAT XTIME” ;
double PRE_ALBEDO(Time) ;
        PRE_ALBEDO:FieldType = 105 ;
        PRE_ALBEDO:MemoryOrder = “0  “ ;
        PRE_ALBEDO:description = “prescribed albedo” ;
        PRE_ALBEDO:units = “” ;
        PRE_ALBEDO:stagger = “” ;
double PRE_ALBEDO_TEND(Time) ;
        PRE_ALBEDO_TEND:FieldType = 105 ;
        PRE_ALBEDO_TEND:MemoryOrder = “0  “ ;
        PRE_ALBEDO_TEND:description = “tendency prescribed albedo” ;
        PRE_ALBEDO_TEND:units = “s-1” ;
        PRE_ALBEDO_TEND:stagger = “” ;
double PRE_LH_FLX(Time) ;
        PRE_LH_FLX:FieldType = 105 ;
        PRE_LH_FLX:MemoryOrder = “0  “ ;
        PRE_LH_FLX:description = “prescribed latent heat flux” ;
        PRE_LH_FLX:units = “W m-2” ;
        PRE_LH_FLX:stagger = “” ;
double PRE_LH_FLX_TEND(Time) ;
        PRE_LH_FLX_TEND:FieldType = 105 ;
        PRE_LH_FLX_TEND:MemoryOrder = “0  “ ;
        PRE_LH_FLX_TEND:description = “tendency prescribed latent heat flux” ;
        PRE_LH_FLX_TEND:units = “W m-2 s-1” ;
        PRE_LH_FLX_TEND:stagger = “” ;
double PRE_SH_FLX(Time) ;
        PRE_SH_FLX:FieldType = 105 ;
        PRE_SH_FLX:MemoryOrder = “0  “ ;
        PRE_SH_FLX:description = “prescribed sensible heat flux” ;
        PRE_SH_FLX:units = “W m-2” ;
        PRE_SH_FLX:stagger = “” ;
double PRE_SH_FLX_TEND(Time) ;
        PRE_SH_FLX_TEND:FieldType = 105 ;
        PRE_SH_FLX_TEND:MemoryOrder = “0  “ ;
        PRE_SH_FLX_TEND:description = “tendency prescribed sensible heat flux” ;
        PRE_SH_FLX_TEND:units = “W m-2 s-1” ;
        PRE_SH_FLX_TEND:stagger = “” ;
double PRE_TSK(Time) ;
        PRE_TSK:FieldType = 105 ;
        PRE_TSK:MemoryOrder = “0  “ ;
        PRE_TSK:description = “prescribed skin temperature” ;
        PRE_TSK:units = “K” ;
```

```
            PRE_TSK:stagger = “” ;
double PRE_TSK_TEND(Time) ;
            PRE_TSK_TEND:FieldType = 105 ;
            PRE_TSK_TEND:MemoryOrder = “0  “ ;
            PRE_TSK_TEND:description = “tendency prescribed skin temperature” ;
            PRE_TSK_TEND:units = “K s-1” ;
            PRE_TSK_TEND:stagger = “” ;
double PSFC(Time, south_north, west_east) ;
            PSFC:FieldType = 105 ;
            PSFC:MemoryOrder = “XY “ ;
            PSFC:description = “SFC PRESSURE” ;
            PSFC:units = “Pa” ;
            PSFC:stagger = “” ;
            PSFC:coordinates = “XLONG XLAT XTIME” ;
double P_HYD(Time, bottom_top, south_north, west_east) ;
            P_HYD:FieldType = 105 ;
            P_HYD:MemoryOrder = “XYZ” ;
            P_HYD:description = “hydrostatic pressure” ;
            P_HYD:units = “Pa” ;
            P_HYD:stagger = “” ;
            P_HYD:coordinates = “XLONG XLAT XTIME” ;
double P_STRAT(Time) ;
            P_STRAT:FieldType = 105 ;
            P_STRAT:MemoryOrder = “0  “ ;
            P_STRAT:description = “BASE STATE PRESSURE AT BOTTOM OF STRATOSPHERE” ;
            P_STRAT:units = “Pa” ;
            P_STRAT:stagger = “” ;
double P_TOP(Time) ;
            P_TOP:FieldType = 105 ;
            P_TOP:MemoryOrder = “0  “ ;
            P_TOP:description = “PRESSURE TOP OF THE MODEL” ;
            P_TOP:units = “Pa” ;
            P_TOP:stagger = “” ;
double Q2(Time, south_north, west_east) ;
            Q2:FieldType = 105 ;
            Q2:MemoryOrder = “XY “ ;
            Q2:description = “QV at 2 M” ;
            Q2:units = “kg kg-1” ;
            Q2:stagger = “” ;
            Q2:coordinates = “XLONG XLAT XTIME” ;
double QCDT_PR(Time, bottom_top, south_north, west_east) ;
            QCDT_PR:FieldType = 105 ;
            QCDT_PR:MemoryOrder = “XYZ” ;
            QCDT_PR:description = “Production rate of vapor by conversion to rain” ;
            QCDT_PR:units = “” ;
            QCDT_PR:stagger = “” ;
            QCDT_PR:coordinates = “XLONG XLAT XTIME” ;
double QCDT_SED(Time, bottom_top, south_north, west_east) ;
            QCDT_SED:FieldType = 105 ;
            QCDT_SED:MemoryOrder = “XYZ” ;
            QCDT_SED:description = “Tendency of cloud water due to sedimentation” ;
            QCDT_SED:units = “” ;
            QCDT_SED:stagger = “” ;
            QCDT_SED:coordinates = “XLONG XLAT XTIME” ;
double QCLOUD(Time, bottom_top, south_north, west_east) ;
            QCLOUD:FieldType = 105 ;
            QCLOUD:MemoryOrder = “XYZ” ;
            QCLOUD:description = “Cloud water mixing ratio” ;
            QCLOUD:units = “kg kg-1” ;
            QCLOUD:stagger = “” ;
            QCLOUD:coordinates = “XLONG XLAT XTIME” ;
double QFX(Time, south_north, west_east) ;
```

```
        QFX:FieldType = 105 ;
        QFX:MemoryOrder = “XY “ ;
        QFX:description = “UPWARD MOISTURE FLUX AT THE SURFACE” ;
        QFX:units = “kg m-2 s-1” ;
        QFX:stagger = “” ;
        QFX:coordinates = “XLONG XLAT XTIME” ;
double QGRAUP(Time, bottom_top, south_north, west_east) ;
        QGRAUP:FieldType = 105 ;
        QGRAUP:MemoryOrder = “XYZ” ;
        QGRAUP:description = “Graupel mixing ratio” ;
        QGRAUP:units = “kg kg-1” ;
        QGRAUP:stagger = “” ;
        QGRAUP:coordinates = “XLONG XLAT XTIME” ;
double QICE(Time, bottom_top, south_north, west_east) ;
        QICE:FieldType = 105 ;
        QICE:MemoryOrder = “XYZ” ;
        QICE:description = “Ice mixing ratio” ;
        QICE:units = “kg kg-1” ;
        QICE:stagger = “” ;
        QICE:coordinates = “XLONG XLAT XTIME” ;
double QNCLOUD(Time, bottom_top, south_north, west_east) ;
        QNCLOUD:FieldType = 105 ;
        QNCLOUD:MemoryOrder = “XYZ” ;
        QNCLOUD:description = “cloud water Number concentration” ;
        QNCLOUD:units = “  kg(-1)” ;
        QNCLOUD:stagger = “” ;
        QNCLOUD:coordinates = “XLONG XLAT XTIME” ;
double QNGRAUPEL(Time, bottom_top, south_north, west_east) ;
        QNGRAUPEL:FieldType = 105 ;
        QNGRAUPEL:MemoryOrder = “XYZ” ;
        QNGRAUPEL:description = “Graupel Number concentration” ;
        QNGRAUPEL:units = “  kg(-1)” ;
        QNGRAUPEL:stagger = “” ;
        QNGRAUPEL:coordinates = “XLONG XLAT XTIME” ;
double QNICE(Time, bottom_top, south_north, west_east) ;
        QNICE:FieldType = 105 ;
        QNICE:MemoryOrder = “XYZ” ;
        QNICE:description = “Ice Number concentration” ;
        QNICE:units = “  kg-1” ;
        QNICE:stagger = “” ;
        QNICE:coordinates = “XLONG XLAT XTIME” ;
double QNRAIN(Time, bottom_top, south_north, west_east) ;
        QNRAIN:FieldType = 105 ;
        QNRAIN:MemoryOrder = “XYZ” ;
        QNRAIN:description = “Rain Number concentration” ;
        QNRAIN:units = “  kg(-1)” ;
        QNRAIN:stagger = “” ;
        QNRAIN:coordinates = “XLONG XLAT XTIME” ;
double QNSNOW(Time, bottom_top, south_north, west_east) ;
        QNSNOW:FieldType = 105 ;
        QNSNOW:MemoryOrder = “XYZ” ;
        QNSNOW:description = “Snow Number concentration” ;
        QNSNOW:units = “  kg(-1)” ;
        QNSNOW:stagger = “” ;
        QNSNOW:coordinates = “XLONG XLAT XTIME” ;
double QRAIN(Time, bottom_top, south_north, west_east) ;
        QRAIN:FieldType = 105 ;
        QRAIN:MemoryOrder = “XYZ” ;
        QRAIN:description = “Rain water mixing ratio” ;
        QRAIN:units = “kg kg-1” ;
        QRAIN:stagger = “” ;
        QRAIN:coordinates = “XLONG XLAT XTIME” ;
```

```
double QRDT_SED(Time, bottom_top, south_north, west_east) ;
        QRDT_SED:FieldType = 105 ;
        QRDT_SED:MemoryOrder = "XYZ" ;
        QRDT_SED:description = "Tendency of rain water due to sedimentation" ;
        QRDT_SED:units = "" ;
        QRDT_SED:stagger = "" ;
        QRDT_SED:coordinates = "XLONG XLAT XTIME" ;
double QSNOW(Time, bottom_top, south_north, west_east) ;
        QSNOW:FieldType = 105 ;
        QSNOW:MemoryOrder = "XYZ" ;
        QSNOW:description = "Snow mixing ratio" ;
        QSNOW:units = "kg kg-1" ;
        QSNOW:stagger = "" ;
        QSNOW:coordinates = "XLONG XLAT XTIME" ;
double QVAPOR(Time, bottom_top, south_north, west_east) ;
        QVAPOR:FieldType = 105 ;
        QVAPOR:MemoryOrder = "XYZ" ;
        QVAPOR:description = "Water vapor mixing ratio" ;
        QVAPOR:units = "kg kg-1" ;
        QVAPOR:stagger = "" ;
        QVAPOR:coordinates = "XLONG XLAT XTIME" ;
double QVDT_COND(Time, bottom_top, south_north, west_east) ;
        QVDT_COND:FieldType = 105 ;
        QVDT_COND:MemoryOrder = "XYZ" ;
        QVDT_COND:description = "Production rate of vapor by conversion to rain" ;
        QVDT_COND:units = "" ;
        QVDT_COND:stagger = "" ;
        QVDT_COND:coordinates = "XLONG XLAT XTIME" ;
double QVDT_LSHOR(Time, bottom_top) ;
        QVDT_LSHOR:FieldType = 105 ;
        QVDT_LSHOR:MemoryOrder = "Z  " ;
        QVDT_LSHOR:description = "qv tendency due to LS horizontal adv" ;
        QVDT_LSHOR:units = "kg kg-1 s-1" ;
        QVDT_LSHOR:stagger = "" ;
double QVDT_LSRLX(Time, bottom_top) ;
        QVDT_LSRLX:FieldType = 105 ;
        QVDT_LSRLX:MemoryOrder = "Z  " ;
        QVDT_LSRLX:description = "qv tendency due to relaxation to LS" ;
        QVDT_LSRLX:units = "kg kg-1 s-1" ;
        QVDT_LSRLX:stagger = "" ;
double QVDT_PR(Time, bottom_top, south_north, west_east) ;
        QVDT_PR:FieldType = 105 ;
        QVDT_PR:MemoryOrder = "XYZ" ;
        QVDT_PR:description = "Production rate of vapor by conversion to rain" ;
        QVDT_PR:units = "" ;
        QVDT_PR:stagger = "" ;
        QVDT_PR:coordinates = "XLONG XLAT XTIME" ;
double QV_ADV(Time, force_layers) ;
        QV_ADV:FieldType = 105 ;
        QV_ADV:MemoryOrder = "Z  " ;
        QV_ADV:description = "tendency qv advection" ;
        QV_ADV:units = "kg kg-1 s-1" ;
        QV_ADV:stagger = "" ;
double QV_ADV_TEND(Time, force_layers) ;
        QV_ADV_TEND:FieldType = 105 ;
        QV_ADV_TEND:MemoryOrder = "Z  " ;
        QV_ADV_TEND:description = "tendency of tendency qv advection" ;
        QV_ADV_TEND:units = "kg kg-1 s-2" ;
        QV_ADV_TEND:stagger = "" ;
double QV_RLX(Time, force_layers) ;
        QV_RLX:FieldType = 105 ;
        QV_RLX:MemoryOrder = "Z  " ;
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```
            QV_RLX:description = “qv relaxation” ;
            QV_RLX:units = “kg kg-1” ;
            QV_RLX:stagger = “” ;
double QV_RLX_TEND(Time, force_layers) ;
            QV_RLX_TEND:FieldType = 105 ;
            QV_RLX_TEND:MemoryOrder = “Z  “ ;
            QV_RLX_TEND:description = “tendency qv relaxation” ;
            QV_RLX_TEND:units = “kg kg-1 s-1” ;
            QV_RLX_TEND:stagger = “” ;
double RAINC(Time, south_north, west_east) ;
            RAINC:FieldType = 105 ;
            RAINC:MemoryOrder = “XY “ ;
            RAINC:description = “ACCUMULATED TOTAL CUMULUS PRECIPITATION” ;
            RAINC:units = “mm” ;
            RAINC:stagger = “” ;
            RAINC:coordinates = “XLONG XLAT XTIME” ;
double RAINNC(Time, south_north, west_east) ;
            RAINNC:FieldType = 105 ;
            RAINNC:MemoryOrder = “XY “ ;
            RAINNC:description = “ACCUMULATED TOTAL GRID SCALE PRECIPITATION” ;
            RAINNC:units = “mm” ;
            RAINNC:stagger = “” ;
            RAINNC:coordinates = “XLONG XLAT XTIME” ;
double RAINSH(Time, south_north, west_east) ;
            RAINSH:FieldType = 105 ;
            RAINSH:MemoryOrder = “XY “ ;
            RAINSH:description = “ACCUMULATED SHALLOW CUMULUS PRECIPITATION” ;
            RAINSH:units = “mm” ;
            RAINSH:stagger = “” ;
            RAINSH:coordinates = “XLONG XLAT XTIME” ;
double RDN(Time, bottom_top) ;
            RDN:FieldType = 105 ;
            RDN:MemoryOrder = “Z  “ ;
            RDN:description = “inverse d(eta) values between half (mass) levels” ;
            RDN:units = “” ;
            RDN:stagger = “” ;
double RDNW(Time, bottom_top) ;
            RDNW:FieldType = 105 ;
            RDNW:MemoryOrder = “Z  “ ;
            RDNW:description = “inverse d(eta) values between full (w) levels” ;
            RDNW:units = “” ;
            RDNW:stagger = “” ;
double RDX(Time) ;
            RDX:FieldType = 105 ;
            RDX:MemoryOrder = “0  “ ;
            RDX:description = “INVERSE X GRID LENGTH” ;
            RDX:units = “” ;
            RDX:stagger = “” ;
double RDY(Time) ;
            RDY:FieldType = 105 ;
            RDY:MemoryOrder = “0  “ ;
            RDY:description = “INVERSE Y GRID LENGTH” ;
            RDY:units = “” ;
            RDY:stagger = “” ;
double REFL_10CM(Time, bottom_top, south_north, west_east) ;
            REFL_10CM:FieldType = 105 ;
            REFL_10CM:MemoryOrder = “XYZ” ;
            REFL_10CM:description = “Radar reflectivity (lamda = 10 cm)” ;
            REFL_10CM:units = “dBZ” ;
            REFL_10CM:stagger = “” ;
            REFL_10CM:coordinates = “XLONG XLAT XTIME” ;
double RESM(Time) ;
```

```
        RESM:FieldType = 105 ;
        RESM:MemoryOrder = "0  " ;
        RESM:description = "TIME WEIGHT CONSTANT FOR SMALL STEPS" ;
        RESM:units = "" ;
        RESM:stagger = "" ;
double RMINACT(Time, bottom_top, south_north, west_east) ;
        RMINACT:FieldType = 105 ;
        RMINACT:MemoryOrder = "XYZ" ;
        RMINACT:description = "Minimum activated radius in Morrison microphysics" ;
        RMINACT:units = "" ;
        RMINACT:stagger = "" ;
        RMINACT:coordinates = "XLONG XLAT XTIME" ;
double RQVLSTEN(Time, bottom_top, south_north, west_east) ;
        RQVLSTEN:FieldType = 105 ;
        RQVLSTEN:MemoryOrder = "XYZ" ;
        RQVLSTEN:description = "coupled Q_V tendency due to LS forcing" ;
        RQVLSTEN:units = "Pa kg kg-1 s-1" ;
        RQVLSTEN:stagger = "" ;
        RQVLSTEN:coordinates = "XLONG XLAT XTIME" ;
double RTHLSTEN(Time, bottom_top, south_north, west_east) ;
        RTHLSTEN:FieldType = 105 ;
        RTHLSTEN:MemoryOrder = "XYZ" ;
        RTHLSTEN:description = "coupled theta tendency due to LS forcing" ;
        RTHLSTEN:units = "Pa K s-1" ;
        RTHLSTEN:stagger = "" ;
        RTHLSTEN:coordinates = "XLONG XLAT XTIME" ;
double RULSTEN(Time, bottom_top, south_north, west_east) ;
        RULSTEN:FieldType = 105 ;
        RULSTEN:MemoryOrder = "XYZ" ;
        RULSTEN:description = "coupled u tendency due to LS forcing" ;
        RULSTEN:units = "Pa m s-2" ;
        RULSTEN:stagger = "" ;
        RULSTEN:coordinates = "XLONG XLAT XTIME" ;
double RVLSTEN(Time, bottom_top, south_north, west_east) ;
        RVLSTEN:FieldType = 105 ;
        RVLSTEN:MemoryOrder = "XYZ" ;
        RVLSTEN:description = "coupled v tendency due to LS forcing" ;
        RVLSTEN:units = "Pa m s-2" ;
        RVLSTEN:stagger = "" ;
        RVLSTEN:coordinates = "XLONG XLAT XTIME" ;
int SAVE_TOPO_FROM_REAL(Time) ;
        SAVE_TOPO_FROM_REAL:FieldType = 106 ;
        SAVE_TOPO_FROM_REAL:MemoryOrder = "0  " ;
        SAVE_TOPO_FROM_REAL:description = "1=original topo from real/0=topo modified by WRF" ;
        SAVE_TOPO_FROM_REAL:units = "flag" ;
        SAVE_TOPO_FROM_REAL:stagger = "" ;
double SEAICE(Time, south_north, west_east) ;
        SEAICE:FieldType = 105 ;
        SEAICE:MemoryOrder = "XY " ;
        SEAICE:description = "SEA ICE FLAG" ;
        SEAICE:units = "" ;
        SEAICE:stagger = "" ;
        SEAICE:coordinates = "XLONG XLAT XTIME" ;
double SEDFQC(Time, bottom_top, south_north, west_east) ;
        SEDFQC:FieldType = 105 ;
        SEDFQC:MemoryOrder = "XYZ" ;
        SEDFQC:description = "sedimentation flux of cloud water" ;
        SEDFQC:units = "kg m-2 s-1" ;
        SEDFQC:stagger = "" ;
        SEDFQC:coordinates = "XLONG XLAT XTIME" ;
double SEDFQR(Time, bottom_top, south_north, west_east) ;
        SEDFQR:FieldType = 105 ;
```

```
        SEDFQR:MemoryOrder = “XYZ” ;
        SEDFQR:description = “sedimentation flux of rain water” ;
        SEDFQR:units = “kg m-2 s-1” ;
        SEDFQR:stagger = “” ;
        SEDFQR:coordinates = “XLONG XLAT XTIME” ;
double SFROFF(Time, south_north, west_east) ;
        SFROFF:FieldType = 105 ;
        SFROFF:MemoryOrder = “XY “ ;
        SFROFF:description = “SURFACE RUNOFF” ;
        SFROFF:units = “mm” ;
        SFROFF:stagger = “” ;
        SFROFF:coordinates = “XLONG XLAT XTIME” ;
double SH2O(Time, soil_layers_stag, south_north, west_east) ;
        SH2O:FieldType = 105 ;
        SH2O:MemoryOrder = “XYZ” ;
        SH2O:description = “SOIL LIQUID WATER” ;
        SH2O:units = “m3 m-3” ;
        SH2O:stagger = “Z” ;
        SH2O:coordinates = “XLONG XLAT XTIME” ;
double SHDMAX(Time, south_north, west_east) ;
        SHDMAX:FieldType = 105 ;
        SHDMAX:MemoryOrder = “XY “ ;
        SHDMAX:description = “ANNUAL MAX VEG FRACTION” ;
        SHDMAX:units = “” ;
        SHDMAX:stagger = “” ;
        SHDMAX:coordinates = “XLONG XLAT XTIME” ;
double SHDMIN(Time, south_north, west_east) ;
        SHDMIN:FieldType = 105 ;
        SHDMIN:MemoryOrder = “XY “ ;
        SHDMIN:description = “ANNUAL MIN VEG FRACTION” ;
        SHDMIN:units = “” ;
        SHDMIN:stagger = “” ;
        SHDMIN:coordinates = “XLONG XLAT XTIME” ;
double SINALPHA(Time, south_north, west_east) ;
        SINALPHA:FieldType = 105 ;
        SINALPHA:MemoryOrder = “XY “ ;
        SINALPHA:description = “Local sine of map rotation” ;
        SINALPHA:units = “” ;
        SINALPHA:stagger = “” ;
        SINALPHA:coordinates = “XLONG XLAT XTIME” ;
double SMAXACT(Time, bottom_top, south_north, west_east) ;
        SMAXACT:FieldType = 105 ;
        SMAXACT:MemoryOrder = “XYZ” ;
        SMAXACT:description = “Maximum supersaturation in Morrison microphysics” ;
        SMAXACT:units = “” ;
        SMAXACT:stagger = “” ;
        SMAXACT:coordinates = “XLONG XLAT XTIME” ;
double SMOIS(Time, soil_layers_stag, south_north, west_east) ;
        SMOIS:FieldType = 105 ;
        SMOIS:MemoryOrder = “XYZ” ;
        SMOIS:description = “SOIL MOISTURE” ;
        SMOIS:units = “m3 m-3” ;
        SMOIS:stagger = “Z” ;
        SMOIS:coordinates = “XLONG XLAT XTIME” ;
double SNOALB(Time, south_north, west_east) ;
        SNOALB:FieldType = 105 ;
        SNOALB:MemoryOrder = “XY “ ;
        SNOALB:description = “ANNUAL MAX SNOW ALBEDO IN FRACTION” ;
        SNOALB:units = “” ;
        SNOALB:stagger = “” ;
        SNOALB:coordinates = “XLONG XLAT XTIME” ;
double SNOW(Time, south_north, west_east) ;
```

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        SNOW:FieldType = 105 ;
        SNOW:MemoryOrder = “XY “ ;
        SNOW:description = “SNOW WATER EQUIVALENT” ;
        SNOW:units = “kg m-2” ;
        SNOW:stagger = “” ;
        SNOW:coordinates = “XLONG XLAT XTIME” ;
double SNOWC(Time, south_north, west_east) ;
        SNOWC:FieldType = 105 ;
        SNOWC:MemoryOrder = “XY “ ;
        SNOWC:description = “FLAG INDICATING SNOW COVERAGE (1 FOR SNOW COVER)” ;
        SNOWC:units = “” ;
        SNOWC:stagger = “” ;
        SNOWC:coordinates = “XLONG XLAT XTIME” ;
double SNOWH(Time, south_north, west_east) ;
        SNOWH:FieldType = 105 ;
        SNOWH:MemoryOrder = “XY “ ;
        SNOWH:description = “PHYSICAL SNOW DEPTH” ;
        SNOWH:units = “m” ;
        SNOWH:stagger = “” ;
        SNOWH:coordinates = “XLONG XLAT XTIME” ;
double SNOWNC(Time, south_north, west_east) ;
        SNOWNC:FieldType = 105 ;
        SNOWNC:MemoryOrder = “XY “ ;
        SNOWNC:description = “ACCUMULATED TOTAL GRID SCALE SNOW AND ICE” ;
        SNOWNC:units = “mm” ;
        SNOWNC:stagger = “” ;
        SNOWNC:coordinates = “XLONG XLAT XTIME” ;
double SR(Time, south_north, west_east) ;
        SR:FieldType = 105 ;
        SR:MemoryOrder = “XY “ ;
        SR:description = “fraction of frozen precipitation” ;
        SR:units = “-” ;
        SR:stagger = “” ;
        SR:coordinates = “XLONG XLAT XTIME” ;
double SST(Time, south_north, west_east) ;
        SST:FieldType = 105 ;
        SST:MemoryOrder = “XY “ ;
        SST:description = “SEA SURFACE TEMPERATURE” ;
        SST:units = “K” ;
        SST:stagger = “” ;
        SST:coordinates = “XLONG XLAT XTIME” ;
double SSTSK(Time, south_north, west_east) ;
        SSTSK:FieldType = 105 ;
        SSTSK:MemoryOrder = “XY “ ;
        SSTSK:description = “SKIN SEA SURFACE TEMPERATURE” ;
        SSTSK:units = “K” ;
        SSTSK:stagger = “” ;
        SSTSK:coordinates = “XLONG XLAT XTIME” ;
double SST_INPUT(Time, south_north, west_east) ;
        SST_INPUT:FieldType = 105 ;
        SST_INPUT:MemoryOrder = “XY “ ;
        SST_INPUT:description = “SEA SURFACE TEMPERATURE FROM WRFLOWINPUT FILE” ;
        SST_INPUT:units = “K” ;
        SST_INPUT:stagger = “” ;
        SST_INPUT:coordinates = “XLONG XLAT XTIME” ;
double SWDNB(Time, south_north, west_east) ;
        SWDNB:FieldType = 105 ;
        SWDNB:MemoryOrder = “XY “ ;
        SWDNB:description = “INSTANTANEOUS DOWNWELLING SHORTWAVE FLUX AT BOTTOM” ;
        SWDNB:units = “W m-2” ;
        SWDNB:stagger = “” ;
        SWDNB:coordinates = “XLONG XLAT XTIME” ;
```

double SWDNBC(Time, south_north, west_east) ;
SWDNBC:FieldType = 105 ;
SWDNBC:MemoryOrder = “XY “ ;
SWDNBC:description = “INSTANTANEOUS DOWNWELLING CLEAR SKY SHORTWAVE FLUX AT BOTTOM” ;
SWDNBC:units = “W m-2” ;
SWDNBC:stagger = “” ;
SWDNBC:coordinates = “XLONG XLAT XTIME” ;
double SWDNFD(Time, bottom_top, south_north, west_east) ;
SWDNFD:FieldType = 105 ;
SWDNFD:MemoryOrder = “XYZ” ;
SWDNFD:description = “SW downward flux in model domain” ;
SWDNFD:units = “” ;
SWDNFD:stagger = “” ;
SWDNFD:coordinates = “XLONG XLAT XTIME” ;
double SWDNT(Time, south_north, west_east) ;
SWDNT:FieldType = 105 ;
SWDNT:MemoryOrder = “XY “ ;
SWDNT:description = “INSTANTANEOUS DOWNWELLING SHORTWAVE FLUX AT TOP” ;
SWDNT:units = “W m-2” ;
SWDNT:stagger = “” ;
SWDNT:coordinates = “XLONG XLAT XTIME” ;
double SWDNTC(Time, south_north, west_east) ;
SWDNTC:FieldType = 105 ;
SWDNTC:MemoryOrder = “XY “ ;
SWDNTC:description = “INSTANTANEOUS DOWNWELLING CLEAR SKY SHORTWAVE FLUX AT TOP” ;
SWDNTC:units = “W m-2” ;
SWDNTC:stagger = “” ;
SWDNTC:coordinates = “XLONG XLAT XTIME” ;
double SWDOWN(Time, south_north, west_east) ;
SWDOWN:FieldType = 105 ;
SWDOWN:MemoryOrder = “XY “ ;
SWDOWN:description = “DOWNWARD SHORT WAVE FLUX AT GROUND SURFACE” ;
SWDOWN:units = “W m-2” ;
SWDOWN:stagger = “” ;
SWDOWN:coordinates = “XLONG XLAT XTIME” ;
double SWNORM(Time, south_north, west_east) ;
SWNORM:FieldType = 105 ;
SWNORM:MemoryOrder = “XY “ ;
SWNORM:description = “NORMAL SHORT WAVE FLUX AT GROUND SURFACE (SLOPE-DEPENDENT)” ;
SWNORM:units = “W m-2” ;
SWNORM:stagger = “” ;
SWNORM:coordinates = “XLONG XLAT XTIME” ;
double SWUPB(Time, south_north, west_east) ;
SWUPB:FieldType = 105 ;
SWUPB:MemoryOrder = “XY “ ;
SWUPB:description = “INSTANTANEOUS UPWELLING SHORTWAVE FLUX AT BOTTOM” ;
SWUPB:units = “W m-2” ;
SWUPB:stagger = “” ;
SWUPB:coordinates = “XLONG XLAT XTIME” ;
double SWUPBC(Time, south_north, west_east) ;
SWUPBC:FieldType = 105 ;
SWUPBC:MemoryOrder = “XY “ ;
SWUPBC:description = “INSTANTANEOUS UPWELLING CLEAR SKY SHORTWAVE FLUX AT BOTTOM” ;
SWUPBC:units = “W m-2” ;
SWUPBC:stagger = “” ;
SWUPBC:coordinates = “XLONG XLAT XTIME” ;
double SWUPFD(Time, bottom_top, south_north, west_east) ;
SWUPFD:FieldType = 105 ;

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        SWUPFD:MemoryOrder = “XYZ” ;
        SWUPFD:description = “SW upward flux in model domain” ;
        SWUPFD:units = “” ;
        SWUPFD:stagger = “” ;
        SWUPFD:coordinates = “XLONG XLAT XTIME” ;
double SWUPT(Time, south_north, west_east) ;
        SWUPT:FieldType = 105 ;
        SWUPT:MemoryOrder = “XY “ ;
        SWUPT:description = “INSTANTANEOUS UPWELLING SHORTWAVE FLUX AT TOP” ;
        SWUPT:units = “W m-2” ;
        SWUPT:stagger = “” ;
        SWUPT:coordinates = “XLONG XLAT XTIME” ;
double SWUPTC(Time, south_north, west_east) ;
        SWUPTC:FieldType = 105 ;
        SWUPTC:MemoryOrder = “XY “ ;
        SWUPTC:description = “INSTANTANEOUS UPWELLING CLEAR SKY SHORTWAVE FLUX AT TOP” ;
        SWUPTC:units = “W m-2” ;
        SWUPTC:stagger = “” ;
        SWUPTC:coordinates = “XLONG XLAT XTIME” ;
double T(Time, bottom_top, south_north, west_east) ;
        T:FieldType = 105 ;
        T:MemoryOrder = “XYZ” ;
        T:description = “perturbation potential temperature (theta-t0)” ;
        T:units = “K” ;
        T:stagger = “” ;
        T:coordinates = “XLONG XLAT XTIME” ;
double T00(Time) ;
        T00:FieldType = 105 ;
        T00:MemoryOrder = “0  “ ;
        T00:description = “BASE STATE TEMPERATURE” ;
        T00:units = “K” ;
        T00:stagger = “” ;
double T2(Time, south_north, west_east) ;
        T2:FieldType = 105 ;
        T2:MemoryOrder = “XY “ ;
        T2:description = “TEMP at 2 M” ;
        T2:units = “K” ;
        T2:stagger = “” ;
        T2:coordinates = “XLONG XLAT XTIME” ;
double TH2(Time, south_north, west_east) ;
        TH2:FieldType = 105 ;
        TH2:MemoryOrder = “XY “ ;
        TH2:description = “POT TEMP at 2 M” ;
        TH2:units = “K” ;
        TH2:stagger = “” ;
        TH2:coordinates = “XLONG XLAT XTIME” ;
double THDT_LSHOR(Time, bottom_top) ;
        THDT_LSHOR:FieldType = 105 ;
        THDT_LSHOR:MemoryOrder = “Z  “ ;
        THDT_LSHOR:description = “th tendency due to LS horizontal adv” ;
        THDT_LSHOR:units = “K s-1” ;
        THDT_LSHOR:stagger = “” ;
double THDT_LSRLX(Time, bottom_top) ;
        THDT_LSRLX:FieldType = 105 ;
        THDT_LSRLX:MemoryOrder = “Z  “ ;
        THDT_LSRLX:description = “th tendency due to relaxation to LS” ;
        THDT_LSRLX:units = “K s-1” ;
        THDT_LSRLX:stagger = “” ;
int THIS_IS_AN_IDEAL_RUN(Time) ;
        THIS_IS_AN_IDEAL_RUN:FieldType = 106 ;
        THIS_IS_AN_IDEAL_RUN:MemoryOrder = “0  “ ;
        THIS_IS_AN_IDEAL_RUN:description = “T/F flag: this is an ARW ideal simulation” ;
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        THIS_IS_AN_IDEAL_RUN:units = "-" ;
        THIS_IS_AN_IDEAL_RUN:stagger = "" ;
double TH_ADV(Time, force_layers) ;
        TH_ADV:FieldType = 105 ;
        TH_ADV:MemoryOrder = "Z  " ;
        TH_ADV:description = "tendency theta advection" ;
        TH_ADV:units = "K s-1" ;
        TH_ADV:stagger = "" ;
double TH_ADV_TEND(Time, force_layers) ;
        TH_ADV_TEND:FieldType = 105 ;
        TH_ADV_TEND:MemoryOrder = "Z  " ;
        TH_ADV_TEND:description = "tendency of tendency theta advection" ;
        TH_ADV_TEND:units = "K s-2" ;
        TH_ADV_TEND:stagger = "" ;
double TH_RLX(Time, force_layers) ;
        TH_RLX:FieldType = 105 ;
        TH_RLX:MemoryOrder = "Z  " ;
        TH_RLX:description = "theta relaxation" ;
        TH_RLX:units = "K" ;
        TH_RLX:stagger = "" ;
double TH_RLX_TEND(Time, force_layers) ;
        TH_RLX_TEND:FieldType = 105 ;
        TH_RLX_TEND:MemoryOrder = "Z  " ;
        TH_RLX_TEND:description = "tendency theta relaxation" ;
        TH_RLX_TEND:units = "K s-1" ;
        TH_RLX_TEND:stagger = "" ;
double TISO(Time) ;
        TISO:FieldType = 105 ;
        TISO:MemoryOrder = "0  " ;
        TISO:description = "TEMP AT WHICH THE BASE T TURNS CONST" ;
        TISO:units = "K" ;
        TISO:stagger = "" ;
double TLP(Time) ;
        TLP:FieldType = 105 ;
        TLP:MemoryOrder = "0  " ;
        TLP:description = "BASE STATE LAPSE RATE" ;
        TLP:units = "" ;
        TLP:stagger = "" ;
double TLP_STRAT(Time) ;
        TLP_STRAT:FieldType = 105 ;
        TLP_STRAT:MemoryOrder = "0  " ;
        TLP_STRAT:description = "BASE STATE LAPSE RATE (DT/D(LN(P)) IN STRATOSPHERE" ;
        TLP_STRAT:units = "K" ;
        TLP_STRAT:stagger = "" ;
double TMN(Time, south_north, west_east) ;
        TMN:FieldType = 105 ;
        TMN:MemoryOrder = "XY " ;
        TMN:description = "SOIL TEMPERATURE AT LOWER BOUNDARY" ;
        TMN:units = "K" ;
        TMN:stagger = "" ;
        TMN:coordinates = "XLONG XLAT XTIME" ;
double TSK(Time, south_north, west_east) ;
        TSK:FieldType = 105 ;
        TSK:MemoryOrder = "XY " ;
        TSK:description = "SURFACE SKIN TEMPERATURE" ;
        TSK:units = "K" ;
        TSK:stagger = "" ;
        TSK:coordinates = "XLONG XLAT XTIME" ;
double TSK_FORCE(Time) ;
        TSK_FORCE:FieldType = 105 ;
        TSK_FORCE:MemoryOrder = "0  " ;
        TSK_FORCE:description = "SCM ideal surface skin temperature" ;
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        TSK_FORCE:units = “W m-2” ;
        TSK_FORCE:stagger = “” ;
double TSK_FORCE_TEND(Time) ;
        TSK_FORCE_TEND:FieldType = 105 ;
        TSK_FORCE_TEND:MemoryOrder = “0  “ ;
        TSK_FORCE_TEND:description = “SCM ideal surface skin temperature tendency” ;
        TSK_FORCE_TEND:units = “W m-2 s-1” ;
        TSK_FORCE_TEND:stagger = “” ;
double TSLB(Time, soil_layers_stag, south_north, west_east) ;
        TSLB:FieldType = 105 ;
        TSLB:MemoryOrder = “XYZ” ;
        TSLB:description = “SOIL TEMPERATURE” ;
        TSLB:units = “K” ;
        TSLB:stagger = “Z” ;
        TSLB:coordinates = “XLONG XLAT XTIME” ;
char Times(Time, DateStrLen) ;
double U(Time, bottom_top, south_north, west_east_stag) ;
        U:FieldType = 105 ;
        U:MemoryOrder = “XYZ” ;
        U:description = “x-wind component” ;
        U:units = “m s-1” ;
        U:stagger = “X” ;
        U:coordinates = “XLONG_U XLAT_U XTIME” ;
double U10(Time, south_north, west_east) ;
        U10:FieldType = 105 ;
        U10:MemoryOrder = “XY “ ;
        U10:description = “U at 10 M” ;
        U10:units = “m s-1” ;
        U10:stagger = “” ;
        U10:coordinates = “XLONG XLAT XTIME” ;
double UDROFF(Time, south_north, west_east) ;
        UDROFF:FieldType = 105 ;
        UDROFF:MemoryOrder = “XY “ ;
        UDROFF:description = “UNDERGROUND RUNOFF” ;
        UDROFF:units = “mm” ;
        UDROFF:stagger = “” ;
        UDROFF:coordinates = “XLONG XLAT XTIME” ;
double UDT_LSRLX(Time, bottom_top) ;
        UDT_LSRLX:FieldType = 105 ;
        UDT_LSRLX:MemoryOrder = “Z  “ ;
        UDT_LSRLX:description = “u tendency due to relaxation to LS” ;
        UDT_LSRLX:units = “m s-2” ;
        UDT_LSRLX:stagger = “” ;
double UST(Time, south_north, west_east) ;
        UST:FieldType = 105 ;
        UST:MemoryOrder = “XY “ ;
        UST:description = “U* IN SIMILARITY THEORY” ;
        UST:units = “m s-1” ;
        UST:stagger = “” ;
        UST:coordinates = “XLONG XLAT XTIME” ;
double U_LS(Time, force_layers) ;
        U_LS:FieldType = 105 ;
        U_LS:MemoryOrder = “Z  “ ;
        U_LS:description = “large-scale zonal wind velocity” ;
        U_LS:units = “m s-1” ;
        U_LS:stagger = “” ;
double U_LS_TEND(Time, force_layers) ;
        U_LS_TEND:FieldType = 105 ;
        U_LS_TEND:MemoryOrder = “Z  “ ;
        U_LS_TEND:description = “tendency large-scale zonal wind velocity” ;
        U_LS_TEND:units = “m s-2” ;
        U_LS_TEND:stagger = “” ;
```

```
double V(Time, bottom_top, south_north_stag, west_east) ;
        V:FieldType = 105 ;
        V:MemoryOrder = "XYZ" ;
        V:description = "y-wind component" ;
        V:units = "m s-1" ;
        V:stagger = "Y" ;
        V:coordinates = "XLONG_V XLAT_V XTIME" ;
double V10(Time, south_north, west_east) ;
        V10:FieldType = 105 ;
        V10:MemoryOrder = "XY " ;
        V10:description = "V at 10 M" ;
        V10:units = "m s-1" ;
        V10:stagger = "" ;
        V10:coordinates = "XLONG XLAT XTIME" ;
double VAR(Time, south_north, west_east) ;
        VAR:FieldType = 105 ;
        VAR:MemoryOrder = "XY " ;
        VAR:description = "OROGRAPHIC VARIANCE" ;
        VAR:units = "" ;
        VAR:stagger = "" ;
        VAR:coordinates = "XLONG XLAT XTIME" ;
double VAR_SSO(Time, south_north, west_east) ;
        VAR_SSO:FieldType = 105 ;
        VAR_SSO:MemoryOrder = "XY " ;
        VAR_SSO:description = "variance of subgrid-scale orography" ;
        VAR_SSO:units = "m2" ;
        VAR_SSO:stagger = "" ;
        VAR_SSO:coordinates = "XLONG XLAT XTIME" ;
double VDT_LSRLX(Time, bottom_top) ;
        VDT_LSRLX:FieldType = 105 ;
        VDT_LSRLX:MemoryOrder = "Z  " ;
        VDT_LSRLX:description = "v tendency due to relaxation to LS" ;
        VDT_LSRLX:units = "m s-2" ;
        VDT_LSRLX:stagger = "" ;
double VEGFRA(Time, south_north, west_east) ;
        VEGFRA:FieldType = 105 ;
        VEGFRA:MemoryOrder = "XY " ;
        VEGFRA:description = "VEGETATION FRACTION" ;
        VEGFRA:units = "" ;
        VEGFRA:stagger = "" ;
        VEGFRA:coordinates = "XLONG XLAT XTIME" ;
double V_LS(Time, force_layers) ;
        V_LS:FieldType = 105 ;
        V_LS:MemoryOrder = "Z  " ;
        V_LS:description = "large-scale meridional wind velocity" ;
        V_LS:units = "m s-1" ;
        V_LS:stagger = "" ;
double V_LS_TEND(Time, force_layers) ;
        V_LS_TEND:FieldType = 105 ;
        V_LS_TEND:MemoryOrder = "Z  " ;
        V_LS_TEND:description = "tendency large-scale meridional wind velocity" ;
        V_LS_TEND:units = "m s-2" ;
        V_LS_TEND:stagger = "" ;
double W(Time, bottom_top_stag, south_north, west_east) ;
        W:FieldType = 105 ;
        W:MemoryOrder = "XYZ" ;
        W:description = "z-wind component" ;
        W:units = "m s-1" ;
        W:stagger = "Z" ;
        W:coordinates = "XLONG XLAT XTIME" ;
double W_DQVDZ(Time, bottom_top, south_north, west_east) ;
        W_DQVDZ:FieldType = 105 ;
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```
            W_DQVDZ:MemoryOrder = “XYZ” ;
            W_DQVDZ:description = “qv tendency due to LS vertical adv” ;
            W_DQVDZ:units = “kg kg-1 s-1” ;
            W_DQVDZ:stagger = “” ;
            W_DQVDZ:coordinates = “XLONG XLAT XTIME” ;
double W_DTHDZ(Time, bottom_top, south_north, west_east) ;
            W_DTHDZ:FieldType = 105 ;
            W_DTHDZ:MemoryOrder = “XYZ” ;
            W_DTHDZ:description = “th tendency due to LS vertical adv” ;
            W_DTHDZ:units = “K s-1” ;
            W_DTHDZ:stagger = “” ;
            W_DTHDZ:coordinates = “XLONG XLAT XTIME” ;
double W_DUDZ(Time, bottom_top, south_north, west_east) ;
            W_DUDZ:FieldType = 105 ;
            W_DUDZ:MemoryOrder = “XYZ” ;
            W_DUDZ:description = “u tendency due to LS vertical adv” ;
            W_DUDZ:units = “m s-2” ;
            W_DUDZ:stagger = “” ;
            W_DUDZ:coordinates = “XLONG XLAT XTIME” ;
double W_DVDZ(Time, bottom_top, south_north, west_east) ;
            W_DVDZ:FieldType = 105 ;
            W_DVDZ:MemoryOrder = “XYZ” ;
            W_DVDZ:description = “v tendency due to LS vertical adv” ;
            W_DVDZ:units = “m s-2” ;
            W_DVDZ:stagger = “” ;
            W_DVDZ:coordinates = “XLONG XLAT XTIME” ;
double W_LS(Time, force_layers) ;
            W_LS:FieldType = 105 ;
            W_LS:MemoryOrder = “Z  “ ;
            W_LS:description = “large-scale vertical velocity” ;
            W_LS:units = “m s-1” ;
            W_LS:stagger = “” ;
double W_LS_TEND(Time, force_layers) ;
            W_LS_TEND:FieldType = 105 ;
            W_LS_TEND:MemoryOrder = “Z  “ ;
            W_LS_TEND:description = “tendency large-scale vertical velocity” ;
            W_LS_TEND:units = “m s-2” ;
            W_LS_TEND:stagger = “” ;
double XICEM(Time, south_north, west_east) ;
            XICEM:FieldType = 105 ;
            XICEM:MemoryOrder = “XY “ ;
            XICEM:description = “SEA ICE FLAG (PREVIOUS STEP)” ;
            XICEM:units = “” ;
            XICEM:stagger = “” ;
            XICEM:coordinates = “XLONG XLAT XTIME” ;
double XLAND(Time, south_north, west_east) ;
            XLAND:FieldType = 105 ;
            XLAND:MemoryOrder = “XY “ ;
            XLAND:description = “LAND MASK (1 FOR LAND, 2 FOR WATER)” ;
            XLAND:units = “” ;
            XLAND:stagger = “” ;
            XLAND:coordinates = “XLONG XLAT XTIME” ;
double XLAT(Time, south_north, west_east) ;
            XLAT:FieldType = 105 ;
            XLAT:MemoryOrder = “XY “ ;
            XLAT:description = “LATITUDE, SOUTH IS NEGATIVE” ;
            XLAT:units = “degree_north” ;
            XLAT:stagger = “” ;
            XLAT:coordinates = “XLONG XLAT” ;
double XLAT_U(Time, south_north, west_east_stag) ;
            XLAT_U:FieldType = 105 ;
            XLAT_U:MemoryOrder = “XY “ ;
```

```
            XLAT_U:description = “LATITUDE, SOUTH IS NEGATIVE” ;
            XLAT_U:units = “degree_north” ;
            XLAT_U:stagger = “X” ;
            XLAT_U:coordinates = “XLONG_U XLAT_U” ;
double XLAT_V(Time, south_north_stag, west_east) ;
            XLAT_V:FieldType = 105 ;
            XLAT_V:MemoryOrder = “XY “ ;
            XLAT_V:description = “LATITUDE, SOUTH IS NEGATIVE” ;
            XLAT_V:units = “degree_north” ;
            XLAT_V:stagger = “Y” ;
            XLAT_V:coordinates = “XLONG_V XLAT_V” ;
double XLONG(Time, south_north, west_east) ;
            XLONG:FieldType = 105 ;
            XLONG:MemoryOrder = “XY “ ;
            XLONG:description = “LONGITUDE, WEST IS NEGATIVE” ;
            XLONG:units = “degree_east” ;
            XLONG:stagger = “” ;
            XLONG:coordinates = “XLONG XLAT” ;
double XLONG_U(Time, south_north, west_east_stag) ;
            XLONG_U:FieldType = 105 ;
            XLONG_U:MemoryOrder = “XY “ ;
            XLONG_U:description = “LONGITUDE, WEST IS NEGATIVE” ;
            XLONG_U:units = “degree_east” ;
            XLONG_U:stagger = “X” ;
            XLONG_U:coordinates = “XLONG_U XLAT_U” ;
double XLONG_V(Time, south_north_stag, west_east) ;
            XLONG_V:FieldType = 105 ;
            XLONG_V:MemoryOrder = “XY “ ;
            XLONG_V:description = “LONGITUDE, WEST IS NEGATIVE” ;
            XLONG_V:units = “degree_east” ;
            XLONG_V:stagger = “Y” ;
            XLONG_V:coordinates = “XLONG_V XLAT_V” ;
double XTIME(Time) ;
            XTIME:FieldType = 105 ;
            XTIME:MemoryOrder = “0  “ ;
            XTIME:description = “minutes since 2015-06-06 12:00:00” ;
            XTIME:units = “minutes since 2015-06-06 12:00:00” ;
            XTIME:stagger = “” ;
double ZETATOP(Time) ;
            ZETATOP:FieldType = 105 ;
            ZETATOP:MemoryOrder = “0  “ ;
            ZETATOP:description = “ZETA AT MODEL TOP” ;
            ZETATOP:units = “” ;
            ZETATOP:stagger = “” ;
double ZI_QT8(Time, south_north, west_east) ;
            ZI_QT8:FieldType = 105 ;
            ZI_QT8:MemoryOrder = “XY “ ;
            ZI_QT8:description = “zi defined by qt” ;
            ZI_QT8:units = “m” ;
            ZI_QT8:stagger = “” ;
            ZI_QT8:coordinates = “XLONG XLAT XTIME” ;
double ZNU(Time, bottom_top) ;
            ZNU:FieldType = 105 ;
            ZNU:MemoryOrder = “Z  “ ;
            ZNU:description = “eta values on half (mass) levels” ;
            ZNU:units = “” ;
            ZNU:stagger = “” ;
double ZNW(Time, bottom_top_stag) ;
            ZNW:FieldType = 105 ;
            ZNW:MemoryOrder = “Z  “ ;
            ZNW:description = “eta values on full (w) levels” ;
            ZNW:units = “” ;
```

```
                ZNW:stagger = “Z” ;
        double ZS(Time, soil_layers_stag) ;
                ZS:FieldType = 105 ;
                ZS:MemoryOrder = “Z  “ ;
                ZS:description = “DEPTHS OF CENTERS OF SOIL LAYERS” ;
                ZS:units = “m” ;
                ZS:stagger = “Z” ;
        double Z_LS(Time, force_layers) ;
                Z_LS:FieldType = 105 ;
                Z_LS:MemoryOrder = “Z  “ ;
                Z_LS:description = “z of large-scale forcings” ;
                Z_LS:units = “m” ;
                Z_LS:stagger = “” ;
        double Z_LS_TEND(Time, force_layers) ;
                Z_LS_TEND:FieldType = 105 ;
                Z_LS_TEND:MemoryOrder = “Z  “ ;
                Z_LS_TEND:description = “tendency of z of large-scale forcings” ;
                Z_LS_TEND:units = “m s-1” ;
                Z_LS_TEND:stagger = “” ;

// global attributes:
                :TITLE = “ OUTPUT FROM WRF V3.7 MODEL” ;
                :START_DATE = “2015-06-06_12:00:00” ;
                :SIMULATION_START_DATE = “2015-06-06_12:00:00” ;
                :WEST-EAST_GRID_DIMENSION = 257 ;
                :SOUTH-NORTH_GRID_DIMENSION = 257 ;
                :BOTTOM-TOP_GRID_DIMENSION = 337 ;
                :DX = 100. ;
                :DY = 100. ;
                :SKEBS_ON = 0 ;
                :SPEC_BDY_FINAL_MU = 0 ;
                :USE_Q_DIABATIC = 0 ;
                :GRIDTYPE = “C” ;
                :DIFF_OPT = 2 ;
                :KM_OPT = 2 ;
                :DAMP_OPT = 3 ;
                :DAMPCOEF = 0.2 ;
                :KHDIF = 1. ;
                :KVDIF = 1. ;
                :MP_PHYSICS = 10 ;
                :RA_LW_PHYSICS = 4 ;
                :RA_SW_PHYSICS = 4 ;
                :SF_SFCLAY_PHYSICS = 1 ;
                :SF_SURFACE_PHYSICS = 0 ;
                :BL_PBL_PHYSICS = 0 ;
                :CU_PHYSICS = 0 ;
                :SF_LAKE_PHYSICS = 0 ;
                :SURFACE_INPUT_SOURCE = 1 ;
                :SST_UPDATE = 0 ;
                :GRID_FDDA = 0 ;
                :GFDDA_INTERVAL_M = 0 ;
                :GFDDA_END_H = 0 ;
                :GRID_SFDDA = 0 ;
                :SGFDDA_INTERVAL_M = 0 ;
                :SGFDDA_END_H = 0 ;
                :HYPSOMETRIC_OPT = 1 ;
                :USE_THETA_M = 1 ;
                :SF_URBAN_PHYSICS = 0 ;
                :SHCU_PHYSICS = 0 ;
                :MFSHCONV = 0 ;
                :FEEDBACK = 0 ;
                :SMOOTH_OPTION = 1 ;
```

:SWRAD_SCAT = 1. ;
:W_DAMPING = 0 ;
:DT = 1. ;
:RADT = 1. ;
:BLDT = 0. ;
:CUDT = 5. ;
:AER_OPT = 0 ;
:SWINT_OPT = 0 ;
:AER_TYPE = 1 ;
:AER_AOD550_OPT = 1 ;
:AER_ANGEXP_OPT = 1 ;
:AER_SSA_OPT = 1 ;
:AER_ASY_OPT = 1 ;
:AER_AOD550_VAL = 0.12 ;
:AER_ANGEXP_VAL = 1.3 ;
:AER_SSA_VAL = 4.94065645841247e-324 ;
:AER_ASY_VAL = 4.94065645841247e-324 ;
:MOIST_ADV_OPT = 2 ;
:SCALAR_ADV_OPT = 2 ;
:TKE_ADV_OPT = 2 ;
:DIFF_6TH_OPT = 0 ;
:DIFF_6TH_FACTOR = 0.12 ;
:OBS_NUDGE_OPT = 0 ;
:BUCKET_MM = -1. ;
:BUCKET_J = -1. ;
:PREC_ACC_DT = 0. ;
:SF_OCEAN_PHYSICS = 0 ;
:ISFTCFLX = 0 ;
:ISHALLOW = 0 ;
:ISFFLX = 11 ;
:ICLOUD = 1 ;
:ICLOUD_CU = 0 ;
:TRACER_PBLMIX = 1 ;
:SCALAR_PBLMIX = 0 ;
:YSU_TOPDOWN_PBLMIX = 0 ;
:GRAV_SETTLING = 0 ;
:DFI_OPT = 0 ;
:SIMULATION_INITIALIZATION_TYPE = “IDEALIZED DATA” ;
:WEST-EAST_PATCH_START_UNSTAG = 1 ;
:WEST-EAST_PATCH_END_UNSTAG = 256 ;
:WEST-EAST_PATCH_START_STAG = 1 ;
:WEST-EAST_PATCH_END_STAG = 257 ;
:SOUTH-NORTH_PATCH_START_UNSTAG = 1 ;
:SOUTH-NORTH_PATCH_END_UNSTAG = 256 ;
:SOUTH-NORTH_PATCH_START_STAG = 1 ;
:SOUTH-NORTH_PATCH_END_STAG = 257 ;
:BOTTOM-TOP_PATCH_START_UNSTAG = 1 ;
:BOTTOM-TOP_PATCH_END_UNSTAG = 336 ;
:BOTTOM-TOP_PATCH_START_STAG = 1 ;
:BOTTOM-TOP_PATCH_END_STAG = 337 ;
:GRID_ID = 1 ;
:PARENT_ID = 0 ;
:I_PARENT_START = 1 ;
:J_PARENT_START = 1 ;
:PARENT_GRID_RATIO = 1 ;
:CEN_LAT = 0. ;
:CEN_LON = 0. ;
:TRUELAT1 = 0. ;
:TRUELAT2 = 0. ;
:MOAD_CEN_LAT = 0. ;
:STAND_LON = 0. ;
:POLE_LAT = 0. ;

```
                :POLE_LON = 0. ;
                :GMT = 0. ;
                :JULYR = 0 ;
                :JULDAY = 1 ;
                :MAP_PROJ = 0 ;
                :MAP_PROJ_CHAR = "Cartesian" ;
                :MMINLU = "" ;
                :NUM_LAND_CAT = 24 ;
                :ISWATER = 16 ;
                :ISLAKE = 0 ;
                :ISICE = 0 ;
                :ISURBAN = 0 ;
                :ISOILWATER = 0 ;
                :doi = "10.5439/1256454" ;
                :contacts = "LASSO PI: William Gustafson (William.Gustafson@pnnl.gov), LASSO Co-PI: Andrew Vogelmann
(vogelmann@bnl.gov)" ;
                :process_version = "Evaluation Version" ;
                :site_id = "sgp" ;
                :facility_id = "C1" ;
                :location_description = "Southern Great Plains (SGP), Lamont, Oklahoma" ;
                :simulation_id_number = 1 ;
                :model_type = "WRF" ;
                :model_version = "3.7" ;
                :output_domain_size = "25.6 km" ;
                :output_start_datetime = "20150606.120000 UTC" ;
                :config_forecast_time = "15 hours" ;
                :config_boundary_method = "periodic" ;
                :config_microphysics = "Morrison" ;
                :config_large_scale_forcing = "VARANAL" ;
                :config_large_scale_forcing_scale = "300 km" ;
                :config_large_scale_forcing_specifics = "VARANARAP LAND" ;
                :output_horizontal_grid_spacing = "100 m" ;
                :output_number_of_levels = "336 levels" ;
                :config_surface_treatment = "VARANAL" ;
                :config_surface_treatment_specifics = "VARANARAP LAND" ;
                :config_initial_condition = "SONDE" ;
                :config_initial_condition_specifics = "SONDE" ;
                :config_aerosol = "constant" ;
                :config_comments = "AGU run; contains random number seed repetition feature in initial conditions (minimal
impact to clouds)" ;
                :config_nickname = "runlas150606aguvar1" ;
                :history = "Sat Jun 25 21:32:21 2016: ncks -O --fl_fmt=netcdf4 --deflate=2 -x -v ^CST_,^CSP_ /lustre/atlas1/
cli120/proj-shared/d3m088/alpha1release/lasso-alpha1_release/sgplassodiagobsmodC1.c1/20150606/sim0001/raw_model/wrfout_
d01_2015-06-06_12:00:00.nc /lustre/atlas1/cli120/proj-shared/d3m088/alpha1release/lasso-alpha1_release/sgplassodiagobsmodC1.
c1/20150606/sim0001/raw_model/wrfout_d01_2015-06-06_12:00:00.nc" ;
                :NCO = "4.3.9" ;
}
```

File: .../20150606/raw_model/wrfstat_d01_2015-06-06_12:00:00.nc

Description: WRF LES statistical output for domain-wide profiles. Values are time averaged over 10-minute periods (for most simulations) with 1-minute sampling and the time label is at the end of the averaging period.

```
netcdf wrfstat_d01_2015-06-06_12\:00\:00 {
dimensions:
        Time = UNLIMITED ; // (4 currently)
        bottom_top = 336 ;
        DateStrLen = 19 ;
variables:
        double CSP_AWQC_C(Time, bottom_top) ;
                CSP_AWQC_C:FieldType = 105 ;
```

```
        CSP_AWQC_C:MemoryOrder = "Z  " ;
        CSP_AWQC_C:description = "Cloud fraction * average over all cloudy grid points of wqc" ;
        CSP_AWQC_C:units = "kg/kg m/s" ;
        CSP_AWQC_C:stagger = "" ;
double CSP_AWQC_CC(Time, bottom_top) ;
        CSP_AWQC_CC:FieldType = 105 ;
        CSP_AWQC_CC:MemoryOrder = "Z  " ;
        CSP_AWQC_CC:description = "Cloudcore fraction * average over all cloudcore grid points of wqc" ;
        CSP_AWQC_CC:units = "kg/kg m/s" ;
        CSP_AWQC_CC:stagger = "" ;
double CSP_AWQL_C(Time, bottom_top) ;
        CSP_AWQL_C:FieldType = 105 ;
        CSP_AWQL_C:MemoryOrder = "Z  " ;
        CSP_AWQL_C:description = "Cloud fraction * average over all cloudy grid points of wql" ;
        CSP_AWQL_C:units = "kg/kg m/s" ;
        CSP_AWQL_C:stagger = "" ;
double CSP_AWQL_CC(Time, bottom_top) ;
        CSP_AWQL_CC:FieldType = 105 ;
        CSP_AWQL_CC:MemoryOrder = "Z  " ;
        CSP_AWQL_CC:description = "Cloudcore fraction * average over all cloudcore grid points of wql" ;
        CSP_AWQL_CC:units = "kg/kg m/s" ;
        CSP_AWQL_CC:stagger = "" ;
double CSP_AWQT_C(Time, bottom_top) ;
        CSP_AWQT_C:FieldType = 105 ;
        CSP_AWQT_C:MemoryOrder = "Z  " ;
        CSP_AWQT_C:description = "Cloud fraction * average over all cloudy grid points of wqt" ;
        CSP_AWQT_C:units = "kg/kg m/s" ;
        CSP_AWQT_C:stagger = "" ;
double CSP_AWQT_CC(Time, bottom_top) ;
        CSP_AWQT_CC:FieldType = 105 ;
        CSP_AWQT_CC:MemoryOrder = "Z  " ;
        CSP_AWQT_CC:description = "Cloudcore fraction * average over all cloudcore grid points of wqt" ;
        CSP_AWQT_CC:units = "kg/kg m/s" ;
        CSP_AWQT_CC:stagger = "" ;
double CSP_AWQV_C(Time, bottom_top) ;
        CSP_AWQV_C:FieldType = 105 ;
        CSP_AWQV_C:MemoryOrder = "Z  " ;
        CSP_AWQV_C:description = "Cloud fraction * average over all cloudy grid points of wqv" ;
        CSP_AWQV_C:units = "kg/kg m/s" ;
        CSP_AWQV_C:stagger = "" ;
double CSP_AWQV_CC(Time, bottom_top) ;
        CSP_AWQV_CC:FieldType = 105 ;
        CSP_AWQV_CC:MemoryOrder = "Z  " ;
        CSP_AWQV_CC:description = "Cloudcore fraction * average over all cloudcore grid points of wqv" ;
        CSP_AWQV_CC:units = "kg/kg m/s" ;
        CSP_AWQV_CC:stagger = "" ;
double CSP_AWTHL_C(Time, bottom_top) ;
        CSP_AWTHL_C:FieldType = 105 ;
        CSP_AWTHL_C:MemoryOrder = "Z  " ;
        CSP_AWTHL_C:description = "Cloud fraction * average over all cloudy grid points of wthl" ;
        CSP_AWTHL_C:units = "K m/s" ;
        CSP_AWTHL_C:stagger = "" ;
double CSP_AWTHL_CC(Time, bottom_top) ;
        CSP_AWTHL_CC:FieldType = 105 ;
        CSP_AWTHL_CC:MemoryOrder = "Z  " ;
        CSP_AWTHL_CC:description = "Cloudcore fraction * average over all cloudcore grid points of wthl" ;
        CSP_AWTHL_CC:units = "K m/s" ;
        CSP_AWTHL_CC:stagger = "" ;
double CSP_AWTHV_C(Time, bottom_top) ;
        CSP_AWTHV_C:FieldType = 105 ;
        CSP_AWTHV_C:MemoryOrder = "Z  " ;
        CSP_AWTHV_C:description = "Cloud fraction * average over all cloudy grid points of wthv" ;
```

```
        CSP_AWTHV_C:units = “K m/s” ;
        CSP_AWTHV_C:stagger = “” ;
double CSP_AWTHV_CC(Time, bottom_top) ;
        CSP_AWTHV_CC:FieldType = 105 ;
        CSP_AWTHV_CC:MemoryOrder = “Z  “ ;
        CSP_AWTHV_CC:description = “Cloudcore fraction * average over all cloudcore grid points of wthv” ;
        CSP_AWTHV_CC:units = “K m/s” ;
        CSP_AWTHV_CC:stagger = “” ;
double CSP_AW_C(Time, bottom_top) ;
        CSP_AW_C:FieldType = 105 ;
        CSP_AW_C:MemoryOrder = “Z  “ ;
        CSP_AW_C:description = “Cloud fraction * average over all cloudy grid points of w” ;
        CSP_AW_C:units = “m/s” ;
        CSP_AW_C:stagger = “” ;
double CSP_AW_CC(Time, bottom_top) ;
        CSP_AW_CC:FieldType = 105 ;
        CSP_AW_CC:MemoryOrder = “Z  “ ;
        CSP_AW_CC:description = “Cloudcore fraction * average over all cloudcore grid points of w” ;
        CSP_AW_CC:units = “m/s” ;
        CSP_AW_CC:stagger = “” ;
double CSP_A_CC(Time, bottom_top) ;
        CSP_A_CC:FieldType = 105 ;
        CSP_A_CC:MemoryOrder = “Z  “ ;
        CSP_A_CC:description = “Fraction of cloudcore grid points” ;
        CSP_A_CC:units = “(0-1)” ;
        CSP_A_CC:stagger = “” ;
double CSP_A_CL(Time, bottom_top) ;
        CSP_A_CL:FieldType = 105 ;
        CSP_A_CL:MemoryOrder = “Z  “ ;
        CSP_A_CL:description = “Fraction of cloudy grid points” ;
        CSP_A_CL:units = “(0-1)” ;
        CSP_A_CL:stagger = “” ;
double CSP_DZ8W(Time, bottom_top) ;
        CSP_DZ8W:FieldType = 105 ;
        CSP_DZ8W:MemoryOrder = “Z  “ ;
        CSP_DZ8W:description = “dz at full level” ;
        CSP_DZ8W:units = “m” ;
        CSP_DZ8W:stagger = “” ;
double CSP_LWC(Time, bottom_top) ;
        CSP_LWC:FieldType = 105 ;
        CSP_LWC:MemoryOrder = “Z  “ ;
        CSP_LWC:description = “Liquid water content” ;
        CSP_LWC:units = “kg/m^3” ;
        CSP_LWC:stagger = “” ;
double CSP_LWDNF(Time, bottom_top) ;
        CSP_LWDNF:FieldType = 105 ;
        CSP_LWDNF:MemoryOrder = “Z  “ ;
        CSP_LWDNF:description = “LW flux downward” ;
        CSP_LWDNF:units = “W/m^2” ;
        CSP_LWDNF:stagger = “” ;
double CSP_LWUPF(Time, bottom_top) ;
        CSP_LWUPF:FieldType = 105 ;
        CSP_LWUPF:MemoryOrder = “Z  “ ;
        CSP_LWUPF:description = “LW flux upward” ;
        CSP_LWUPF:units = “W/m^2” ;
        CSP_LWUPF:stagger = “” ;
double CSP_P(Time, bottom_top) ;
        CSP_P:FieldType = 105 ;
        CSP_P:MemoryOrder = “Z  “ ;
        CSP_P:description = “Pressure” ;
        CSP_P:units = “Pa” ;
        CSP_P:stagger = “” ;
```

```
double CSP_QC(Time, bottom_top) ;
        CSP_QC:FieldType = 105 ;
        CSP_QC:MemoryOrder = "Z  " ;
        CSP_QC:description = "Cloud water mixing ratio" ;
        CSP_QC:units = "kg/kg" ;
        CSP_QC:stagger = "" ;
double CSP_QCDT_PR(Time, bottom_top) ;
        CSP_QCDT_PR:FieldType = 105 ;
        CSP_QCDT_PR:MemoryOrder = "Z  " ;
        CSP_QCDT_PR:description = "dqc/dt due to conversion to precipitation" ;
        CSP_QCDT_PR:units = "kg/kg/s" ;
        CSP_QCDT_PR:stagger = "" ;
double CSP_QCDT_SED(Time, bottom_top) ;
        CSP_QCDT_SED:FieldType = 105 ;
        CSP_QCDT_SED:MemoryOrder = "Z  " ;
        CSP_QCDT_SED:description = "dqc/dt due to sedimentation" ;
        CSP_QCDT_SED:units = "kg/kg/s" ;
        CSP_QCDT_SED:stagger = "" ;
double CSP_QC_C(Time, bottom_top) ;
        CSP_QC_C:FieldType = 105 ;
        CSP_QC_C:MemoryOrder = "Z  " ;
        CSP_QC_C:description = "Average over all cloudy grid points of qc" ;
        CSP_QC_C:units = "kg/kg" ;
        CSP_QC_C:stagger = "" ;
double CSP_QC_CC(Time, bottom_top) ;
        CSP_QC_CC:FieldType = 105 ;
        CSP_QC_CC:MemoryOrder = "Z  " ;
        CSP_QC_CC:description = "Average over all cloudcore grid points of qc" ;
        CSP_QC_CC:units = "kg/kg" ;
        CSP_QC_CC:stagger = "" ;
double CSP_QL(Time, bottom_top) ;
        CSP_QL:FieldType = 105 ;
        CSP_QL:MemoryOrder = "Z  " ;
        CSP_QL:description = "Liquid water mixing ratio" ;
        CSP_QL:units = "kg/kg" ;
        CSP_QL:stagger = "" ;
double CSP_QL_C(Time, bottom_top) ;
        CSP_QL_C:FieldType = 105 ;
        CSP_QL_C:MemoryOrder = "Z  " ;
        CSP_QL_C:description = "Average over all cloudy grid points of ql" ;
        CSP_QL_C:units = "kg/kg" ;
        CSP_QL_C:stagger = "" ;
double CSP_QL_CC(Time, bottom_top) ;
        CSP_QL_CC:FieldType = 105 ;
        CSP_QL_CC:MemoryOrder = "Z  " ;
        CSP_QL_CC:description = "Average over all cloudcore grid points of ql" ;
        CSP_QL_CC:units = "kg/kg" ;
        CSP_QL_CC:stagger = "" ;
double CSP_QNC_C(Time, bottom_top) ;
        CSP_QNC_C:FieldType = 105 ;
        CSP_QNC_C:MemoryOrder = "Z  " ;
        CSP_QNC_C:description = "Average over all cloudy grid points of qnc" ;
        CSP_QNC_C:units = "cm-3" ;
        CSP_QNC_C:stagger = "" ;
double CSP_QRDT_SED(Time, bottom_top) ;
        CSP_QRDT_SED:FieldType = 105 ;
        CSP_QRDT_SED:MemoryOrder = "Z  " ;
        CSP_QRDT_SED:description = "dqr/dt due to sedimentation" ;
        CSP_QRDT_SED:units = "kg/kg/s" ;
        CSP_QRDT_SED:stagger = "" ;
double CSP_QT(Time, bottom_top) ;
        CSP_QT:FieldType = 105 ;
```

```
        CSP_QT:MemoryOrder = "Z  " ;
        CSP_QT:description = "Total water mixing ratio" ;
        CSP_QT:units = "kg/kg" ;
        CSP_QT:stagger = "" ;
double CSP_QT_C(Time, bottom_top) ;
        CSP_QT_C:FieldType = 105 ;
        CSP_QT_C:MemoryOrder = "Z  " ;
        CSP_QT_C:description = "Average over all cloudy grid points of qt" ;
        CSP_QT_C:units = "kg/kg" ;
        CSP_QT_C:stagger = "" ;
double CSP_QT_CC(Time, bottom_top) ;
        CSP_QT_CC:FieldType = 105 ;
        CSP_QT_CC:MemoryOrder = "Z  " ;
        CSP_QT_CC:description = "Average over all cloudcore grid points of qt" ;
        CSP_QT_CC:units = "kg/kg" ;
        CSP_QT_CC:stagger = "" ;
double CSP_QV(Time, bottom_top) ;
        CSP_QV:FieldType = 105 ;
        CSP_QV:MemoryOrder = "Z  " ;
        CSP_QV:description = "Water vapor mixing ratio" ;
        CSP_QV:units = "kg/kg" ;
        CSP_QV:stagger = "" ;
double CSP_QV2(Time, bottom_top) ;
        CSP_QV2:FieldType = 105 ;
        CSP_QV2:MemoryOrder = "Z  " ;
        CSP_QV2:description = "Variance of qv" ;
        CSP_QV2:units = "kg^2/kg^2" ;
        CSP_QV2:stagger = "" ;
double CSP_QVDT_COND(Time, bottom_top) ;
        CSP_QVDT_COND:FieldType = 105 ;
        CSP_QVDT_COND:MemoryOrder = "Z  " ;
        CSP_QVDT_COND:description = "dqv/dt due to net condensation" ;
        CSP_QVDT_COND:units = "kg/kg/s" ;
        CSP_QVDT_COND:stagger = "" ;
double CSP_QVDT_LS(Time, bottom_top) ;
        CSP_QVDT_LS:FieldType = 105 ;
        CSP_QVDT_LS:MemoryOrder = "Z  " ;
        CSP_QVDT_LS:description = "dqv/dt due to large-scale forcing" ;
        CSP_QVDT_LS:units = "kg/kg/s" ;
        CSP_QVDT_LS:stagger = "" ;
double CSP_QVDT_LSHOR(Time, bottom_top) ;
        CSP_QVDT_LSHOR:FieldType = 105 ;
        CSP_QVDT_LSHOR:MemoryOrder = "Z  " ;
        CSP_QVDT_LSHOR:description = "qv tendency due to LS horizontal adv" ;
        CSP_QVDT_LSHOR:units = "kg kg-1 s-1" ;
        CSP_QVDT_LSHOR:stagger = "" ;
double CSP_QVDT_LSRLX(Time, bottom_top) ;
        CSP_QVDT_LSRLX:FieldType = 105 ;
        CSP_QVDT_LSRLX:MemoryOrder = "Z  " ;
        CSP_QVDT_LSRLX:description = "qv tendency due to relaxation to LS" ;
        CSP_QVDT_LSRLX:units = "kg kg-1 s-1" ;
        CSP_QVDT_LSRLX:stagger = "" ;
double CSP_QVDT_LSVER(Time, bottom_top) ;
        CSP_QVDT_LSVER:FieldType = 105 ;
        CSP_QVDT_LSVER:MemoryOrder = "Z  " ;
        CSP_QVDT_LSVER:description = "qv tendency due to LS horizontal adv" ;
        CSP_QVDT_LSVER:units = "kg kg-1 s-1" ;
        CSP_QVDT_LSVER:stagger = "" ;
double CSP_QVDT_PR(Time, bottom_top) ;
        CSP_QVDT_PR:FieldType = 105 ;
        CSP_QVDT_PR:MemoryOrder = "Z  " ;
        CSP_QVDT_PR:description = "dqv/dt due to conversion to precipitation" ;
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        CSP_QVDT_PR:units = “kg/kg/s” ;
        CSP_QVDT_PR:stagger = “” ;
double CSP_QV_C(Time, bottom_top) ;
        CSP_QV_C:FieldType = 105 ;
        CSP_QV_C:MemoryOrder = “Z  “ ;
        CSP_QV_C:description = “Average over all cloudy grid points of qv” ;
        CSP_QV_C:units = “kg/kg” ;
        CSP_QV_C:stagger = “” ;
double CSP_QV_CC(Time, bottom_top) ;
        CSP_QV_CC:FieldType = 105 ;
        CSP_QV_CC:MemoryOrder = “Z  “ ;
        CSP_QV_CC:description = “Average over all cloudcore grid points of qv” ;
        CSP_QV_CC:units = “kg/kg” ;
        CSP_QV_CC:stagger = “” ;
double CSP_RHO(Time, bottom_top) ;
        CSP_RHO:FieldType = 105 ;
        CSP_RHO:MemoryOrder = “Z  “ ;
        CSP_RHO:description = “Density” ;
        CSP_RHO:units = “kg/m^3” ;
        CSP_RHO:stagger = “” ;
double CSP_RMINACTMIN(Time, bottom_top) ;
        CSP_RMINACTMIN:FieldType = 105 ;
        CSP_RMINACTMIN:MemoryOrder = “Z  “ ;
        CSP_RMINACTMIN:description = “Min of min activated radius in Morrison microphysics” ;
        CSP_RMINACTMIN:units = “” ;
        CSP_RMINACTMIN:stagger = “” ;
double CSP_SEDFQC(Time, bottom_top) ;
        CSP_SEDFQC:FieldType = 105 ;
        CSP_SEDFQC:MemoryOrder = “Z  “ ;
        CSP_SEDFQC:description = “Sedimentation flux of qc” ;
        CSP_SEDFQC:units = “kg /m^2/s” ;
        CSP_SEDFQC:stagger = “” ;
double CSP_SEDFQR(Time, bottom_top) ;
        CSP_SEDFQR:FieldType = 105 ;
        CSP_SEDFQR:MemoryOrder = “Z  “ ;
        CSP_SEDFQR:description = “Sedimentation (Precipitation) flux of qr” ;
        CSP_SEDFQR:units = “kg /m^2/s” ;
        CSP_SEDFQR:stagger = “” ;
double CSP_SIGC_QC(Time, bottom_top) ;
        CSP_SIGC_QC:FieldType = 105 ;
        CSP_SIGC_QC:MemoryOrder = “Z  “ ;
        CSP_SIGC_QC:description = “Incloud variance of qc” ;
        CSP_SIGC_QC:units = “(kg/kg)^2” ;
        CSP_SIGC_QC:stagger = “” ;
double CSP_SIGC_QL(Time, bottom_top) ;
        CSP_SIGC_QL:FieldType = 105 ;
        CSP_SIGC_QL:MemoryOrder = “Z  “ ;
        CSP_SIGC_QL:description = “Incloud variance of ql” ;
        CSP_SIGC_QL:units = “(kg/kg)^2” ;
        CSP_SIGC_QL:stagger = “” ;
double CSP_SIGC_QT(Time, bottom_top) ;
        CSP_SIGC_QT:FieldType = 105 ;
        CSP_SIGC_QT:MemoryOrder = “Z  “ ;
        CSP_SIGC_QT:description = “Incloud variance of qt” ;
        CSP_SIGC_QT:units = “(kg/kg)^2” ;
        CSP_SIGC_QT:stagger = “” ;
double CSP_SIGC_THL(Time, bottom_top) ;
        CSP_SIGC_THL:FieldType = 105 ;
        CSP_SIGC_THL:MemoryOrder = “Z  “ ;
        CSP_SIGC_THL:description = “Incloud variance of thl” ;
        CSP_SIGC_THL:units = “K^2” ;
        CSP_SIGC_THL:stagger = “” ;
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double CSP_SIGC_THV(Time, bottom_top) ;
        CSP_SIGC_THV:FieldType = 105 ;
        CSP_SIGC_THV:MemoryOrder = "Z  " ;
        CSP_SIGC_THV:description = "Incloud variance of thv" ;
        CSP_SIGC_THV:units = "K^2" ;
        CSP_SIGC_THV:stagger = "" ;
double CSP_SMAXACTMAX(Time, bottom_top) ;
        CSP_SMAXACTMAX:FieldType = 105 ;
        CSP_SMAXACTMAX:MemoryOrder = "Z  " ;
        CSP_SMAXACTMAX:description = "Max of max supersat in Morrison microphysics" ;
        CSP_SMAXACTMAX:units = "" ;
        CSP_SMAXACTMAX:stagger = "" ;
double CSP_SPEQV(Time, bottom_top) ;
        CSP_SPEQV:FieldType = 105 ;
        CSP_SPEQV:MemoryOrder = "Z  " ;
        CSP_SPEQV:description = "Specific humidity" ;
        CSP_SPEQV:units = "kg/kg" ;
        CSP_SPEQV:stagger = "" ;
double CSP_SWDNF(Time, bottom_top) ;
        CSP_SWDNF:FieldType = 105 ;
        CSP_SWDNF:MemoryOrder = "Z  " ;
        CSP_SWDNF:description = "SW flux downward" ;
        CSP_SWDNF:units = "W/m^2" ;
        CSP_SWDNF:stagger = "" ;
double CSP_SWUPF(Time, bottom_top) ;
        CSP_SWUPF:FieldType = 105 ;
        CSP_SWUPF:MemoryOrder = "Z  " ;
        CSP_SWUPF:description = "SW flux upward" ;
        CSP_SWUPF:units = "W/m^2" ;
        CSP_SWUPF:stagger = "" ;
double CSP_TH(Time, bottom_top) ;
        CSP_TH:FieldType = 105 ;
        CSP_TH:MemoryOrder = "Z  " ;
        CSP_TH:description = "Potential temperature" ;
        CSP_TH:units = "K" ;
        CSP_TH:stagger = "" ;
double CSP_TH2(Time, bottom_top) ;
        CSP_TH2:FieldType = 105 ;
        CSP_TH2:MemoryOrder = "Z  " ;
        CSP_TH2:description = "Variance of th" ;
        CSP_TH2:units = "K^2" ;
        CSP_TH2:stagger = "" ;
double CSP_THDT_COND(Time, bottom_top) ;
        CSP_THDT_COND:FieldType = 105 ;
        CSP_THDT_COND:MemoryOrder = "Z  " ;
        CSP_THDT_COND:description = "dth/dt due to net condensation" ;
        CSP_THDT_COND:units = "K/s" ;
        CSP_THDT_COND:stagger = "" ;
double CSP_THDT_LS(Time, bottom_top) ;
        CSP_THDT_LS:FieldType = 105 ;
        CSP_THDT_LS:MemoryOrder = "Z  " ;
        CSP_THDT_LS:description = "dth/dt due to large-scale forcing" ;
        CSP_THDT_LS:units = "K/s" ;
        CSP_THDT_LS:stagger = "" ;
double CSP_THDT_LSHOR(Time, bottom_top) ;
        CSP_THDT_LSHOR:FieldType = 105 ;
        CSP_THDT_LSHOR:MemoryOrder = "Z  " ;
        CSP_THDT_LSHOR:description = "th tendency due to LS horizontal adv" ;
        CSP_THDT_LSHOR:units = "K s-1" ;
        CSP_THDT_LSHOR:stagger = "" ;
double CSP_THDT_LSRLX(Time, bottom_top) ;
        CSP_THDT_LSRLX:FieldType = 105 ;
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        CSP_THDT_LSRLX:MemoryOrder = "Z  " ;
        CSP_THDT_LSRLX:description = "th tendency due to relaxation to LS" ;
        CSP_THDT_LSRLX:units = "K s-1" ;
        CSP_THDT_LSRLX:stagger = "" ;
double CSP_THDT_LSVER(Time, bottom_top) ;
        CSP_THDT_LSVER:FieldType = 105 ;
        CSP_THDT_LSVER:MemoryOrder = "Z  " ;
        CSP_THDT_LSVER:description = "th tendency due to LS horizontal adv" ;
        CSP_THDT_LSVER:units = "K s-1" ;
        CSP_THDT_LSVER:stagger = "" ;
double CSP_THDT_LW(Time, bottom_top) ;
        CSP_THDT_LW:FieldType = 105 ;
        CSP_THDT_LW:MemoryOrder = "Z  " ;
        CSP_THDT_LW:description = "dth/dt due to LW radiation" ;
        CSP_THDT_LW:units = "K/s" ;
        CSP_THDT_LW:stagger = "" ;
double CSP_THDT_SW(Time, bottom_top) ;
        CSP_THDT_SW:FieldType = 105 ;
        CSP_THDT_SW:MemoryOrder = "Z  " ;
        CSP_THDT_SW:description = "dth/dt due to SW radiation" ;
        CSP_THDT_SW:units = "K/s" ;
        CSP_THDT_SW:stagger = "" ;
double CSP_THL(Time, bottom_top) ;
        CSP_THL:FieldType = 105 ;
        CSP_THL:MemoryOrder = "Z  " ;
        CSP_THL:description = "Liquid water potential temperature" ;
        CSP_THL:units = "K" ;
        CSP_THL:stagger = "" ;
double CSP_THL2(Time, bottom_top) ;
        CSP_THL2:FieldType = 105 ;
        CSP_THL2:MemoryOrder = "Z  " ;
        CSP_THL2:description = "Variance of thl" ;
        CSP_THL2:units = "K^2" ;
        CSP_THL2:stagger = "" ;
double CSP_THL_C(Time, bottom_top) ;
        CSP_THL_C:FieldType = 105 ;
        CSP_THL_C:MemoryOrder = "Z  " ;
        CSP_THL_C:description = "Average over all cloudy grid points of thl" ;
        CSP_THL_C:units = "K" ;
        CSP_THL_C:stagger = "" ;
double CSP_THL_CC(Time, bottom_top) ;
        CSP_THL_CC:FieldType = 105 ;
        CSP_THL_CC:MemoryOrder = "Z  " ;
        CSP_THL_CC:description = "Average over all cloudcore grid points of thl" ;
        CSP_THL_CC:units = "K" ;
        CSP_THL_CC:stagger = "" ;
double CSP_THV(Time, bottom_top) ;
        CSP_THV:FieldType = 105 ;
        CSP_THV:MemoryOrder = "Z  " ;
        CSP_THV:description = "Virtual potential temperature" ;
        CSP_THV:units = "K" ;
        CSP_THV:stagger = "" ;
double CSP_THV2(Time, bottom_top) ;
        CSP_THV2:FieldType = 105 ;
        CSP_THV2:MemoryOrder = "Z  " ;
        CSP_THV2:description = "Variance of thv" ;
        CSP_THV2:units = "K^2" ;
        CSP_THV2:stagger = "" ;
double CSP_THV_C(Time, bottom_top) ;
        CSP_THV_C:FieldType = 105 ;
        CSP_THV_C:MemoryOrder = "Z  " ;
        CSP_THV_C:description = "Average over all cloudy grid points of thv" ;
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        CSP_THV_C:units = “K” ;
        CSP_THV_C:stagger = “” ;
double CSP_THV_CC(Time, bottom_top) ;
        CSP_THV_CC:FieldType = 105 ;
        CSP_THV_CC:MemoryOrder = “Z  “ ;
        CSP_THV_CC:description = “Average over all cloudcore grid points of thv” ;
        CSP_THV_CC:units = “K” ;
        CSP_THV_CC:stagger = “” ;
double CSP_TKE_BU(Time, bottom_top) ;
        CSP_TKE_BU:FieldType = 105 ;
        CSP_TKE_BU:MemoryOrder = “Z  “ ;
        CSP_TKE_BU:description = “RS TKE buoyancy production” ;
        CSP_TKE_BU:units = “m^2/s^3” ;
        CSP_TKE_BU:stagger = “” ;
double CSP_TKE_DI(Time, bottom_top) ;
        CSP_TKE_DI:FieldType = 105 ;
        CSP_TKE_DI:MemoryOrder = “Z  “ ;
        CSP_TKE_DI:description = “TKE dissipation” ;
        CSP_TKE_DI:units = “m^2/s^3” ;
        CSP_TKE_DI:stagger = “” ;
double CSP_TKE_RS(Time, bottom_top) ;
        CSP_TKE_RS:FieldType = 105 ;
        CSP_TKE_RS:MemoryOrder = “Z  “ ;
        CSP_TKE_RS:description = “RS TKE” ;
        CSP_TKE_RS:units = “m^2/s^2” ;
        CSP_TKE_RS:stagger = “” ;
double CSP_TKE_SGS(Time, bottom_top) ;
        CSP_TKE_SGS:FieldType = 105 ;
        CSP_TKE_SGS:MemoryOrder = “Z  “ ;
        CSP_TKE_SGS:description = “SGS TKE” ;
        CSP_TKE_SGS:units = “m^2/s^2” ;
        CSP_TKE_SGS:stagger = “” ;
double CSP_TKE_SH(Time, bottom_top) ;
        CSP_TKE_SH:FieldType = 105 ;
        CSP_TKE_SH:MemoryOrder = “Z  “ ;
        CSP_TKE_SH:description = “RS TKE shear production” ;
        CSP_TKE_SH:units = “m^2/s^3” ;
        CSP_TKE_SH:stagger = “” ;
double CSP_TKE_TR(Time, bottom_top) ;
        CSP_TKE_TR:FieldType = 105 ;
        CSP_TKE_TR:MemoryOrder = “Z  “ ;
        CSP_TKE_TR:description = “RS TKE turbulent + pressure transport” ;
        CSP_TKE_TR:units = “m^2/s^3” ;
        CSP_TKE_TR:stagger = “” ;
double CSP_U(Time, bottom_top) ;
        CSP_U:FieldType = 105 ;
        CSP_U:MemoryOrder = “Z  “ ;
        CSP_U:description = “Zonal wind” ;
        CSP_U:units = “m/s” ;
        CSP_U:stagger = “” ;
double CSP_U2(Time, bottom_top) ;
        CSP_U2:FieldType = 105 ;
        CSP_U2:MemoryOrder = “Z  “ ;
        CSP_U2:description = “u_p^2” ;
        CSP_U2:units = “m^2/s^2” ;
        CSP_U2:stagger = “” ;
double CSP_U2V2(Time, bottom_top) ;
        CSP_U2V2:FieldType = 105 ;
        CSP_U2V2:MemoryOrder = “Z  “ ;
        CSP_U2V2:description = “u_p^2+v_p^2” ;
        CSP_U2V2:units = “m^2/s^2” ;
        CSP_U2V2:stagger = “” ;
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double CSP_UDT_LS(Time, bottom_top) ;
        CSP_UDT_LS:FieldType = 105 ;
        CSP_UDT_LS:MemoryOrder = "Z  " ;
        CSP_UDT_LS:description = "u tendency due to LS forcing" ;
        CSP_UDT_LS:units = "m s-2" ;
        CSP_UDT_LS:stagger = "" ;
double CSP_UDT_LSRLX(Time, bottom_top) ;
        CSP_UDT_LSRLX:FieldType = 105 ;
        CSP_UDT_LSRLX:MemoryOrder = "Z  " ;
        CSP_UDT_LSRLX:description = "u tendency due to relaxation to LS" ;
        CSP_UDT_LSRLX:units = "m s-2" ;
        CSP_UDT_LSRLX:stagger = "" ;
double CSP_UDT_LSVER(Time, bottom_top) ;
        CSP_UDT_LSVER:FieldType = 105 ;
        CSP_UDT_LSVER:MemoryOrder = "Z  " ;
        CSP_UDT_LSVER:description = "u tendency due to LS vertical adv" ;
        CSP_UDT_LSVER:units = "m s-2" ;
        CSP_UDT_LSVER:stagger = "" ;
double CSP_UW(Time, bottom_top) ;
        CSP_UW:FieldType = 105 ;
        CSP_UW:MemoryOrder = "Z  " ;
        CSP_UW:description = "x-momentum flux uw (rs+sgs)" ;
        CSP_UW:units = "m^2/s^2" ;
        CSP_UW:stagger = "" ;
double CSP_UW_SGS(Time, bottom_top) ;
        CSP_UW_SGS:FieldType = 105 ;
        CSP_UW_SGS:MemoryOrder = "Z  " ;
        CSP_UW_SGS:description = "x-momentum flux uw (sgs)" ;
        CSP_UW_SGS:units = "m^2/s^2" ;
        CSP_UW_SGS:stagger = "" ;
double CSP_V(Time, bottom_top) ;
        CSP_V:FieldType = 105 ;
        CSP_V:MemoryOrder = "Z  " ;
        CSP_V:description = "Meridional wind" ;
        CSP_V:units = "m/s" ;
        CSP_V:stagger = "" ;
double CSP_V2(Time, bottom_top) ;
        CSP_V2:FieldType = 105 ;
        CSP_V2:MemoryOrder = "Z  " ;
        CSP_V2:description = "v_p^2" ;
        CSP_V2:units = "m^2/s^2" ;
        CSP_V2:stagger = "" ;
double CSP_VDT_LS(Time, bottom_top) ;
        CSP_VDT_LS:FieldType = 105 ;
        CSP_VDT_LS:MemoryOrder = "Z  " ;
        CSP_VDT_LS:description = "v tendency due to LS forcing" ;
        CSP_VDT_LS:units = "m s-2" ;
        CSP_VDT_LS:stagger = "" ;
double CSP_VDT_LSRLX(Time, bottom_top) ;
        CSP_VDT_LSRLX:FieldType = 105 ;
        CSP_VDT_LSRLX:MemoryOrder = "Z  " ;
        CSP_VDT_LSRLX:description = "v tendency due to relaxation to LS" ;
        CSP_VDT_LSRLX:units = "m s-2" ;
        CSP_VDT_LSRLX:stagger = "" ;
double CSP_VDT_LSVER(Time, bottom_top) ;
        CSP_VDT_LSVER:FieldType = 105 ;
        CSP_VDT_LSVER:MemoryOrder = "Z  " ;
        CSP_VDT_LSVER:description = "v tendency due to LS vertical adv" ;
        CSP_VDT_LSVER:units = "m s-2" ;
        CSP_VDT_LSVER:stagger = "" ;
double CSP_VW(Time, bottom_top) ;
        CSP_VW:FieldType = 105 ;
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        CSP_VW:MemoryOrder = "Z  " ;
        CSP_VW:description = "y-momentum flux vw (rs+sgs)" ;
        CSP_VW:units = "m^2/s^2" ;
        CSP_VW:stagger = "" ;
double CSP_VW_SGS(Time, bottom_top) ;
        CSP_VW_SGS:FieldType = 105 ;
        CSP_VW_SGS:MemoryOrder = "Z  " ;
        CSP_VW_SGS:description = "y-momentum flux vw (sgs)" ;
        CSP_VW_SGS:units = "m^2/s^2" ;
        CSP_VW_SGS:stagger = "" ;
double CSP_W(Time, bottom_top) ;
        CSP_W:FieldType = 105 ;
        CSP_W:MemoryOrder = "Z  " ;
        CSP_W:description = "Vertical motion" ;
        CSP_W:units = "m/s" ;
        CSP_W:stagger = "" ;
double CSP_W2(Time, bottom_top) ;
        CSP_W2:FieldType = 105 ;
        CSP_W2:MemoryOrder = "Z  " ;
        CSP_W2:description = "w_p^2" ;
        CSP_W2:units = "m^2/s^2" ;
        CSP_W2:stagger = "" ;
double CSP_W3(Time, bottom_top) ;
        CSP_W3:FieldType = 105 ;
        CSP_W3:MemoryOrder = "Z  " ;
        CSP_W3:description = "w_p^3" ;
        CSP_W3:units = "m^3/s^3" ;
        CSP_W3:stagger = "" ;
double CSP_WMAX(Time, bottom_top) ;
        CSP_WMAX:FieldType = 105 ;
        CSP_WMAX:MemoryOrder = "Z  " ;
        CSP_WMAX:description = "Max value of vertical motion" ;
        CSP_WMAX:units = "m s^-1" ;
        CSP_WMAX:stagger = "" ;
double CSP_WMIN(Time, bottom_top) ;
        CSP_WMIN:FieldType = 105 ;
        CSP_WMIN:MemoryOrder = "Z  " ;
        CSP_WMIN:description = "Min value of vertical motion" ;
        CSP_WMIN:units = "m s^-1" ;
        CSP_WMIN:stagger = "" ;
double CSP_WQC(Time, bottom_top) ;
        CSP_WQC:FieldType = 105 ;
        CSP_WQC:MemoryOrder = "Z  " ;
        CSP_WQC:description = "Cloud water flux (rs+sgs)" ;
        CSP_WQC:units = "kg/kg m/s" ;
        CSP_WQC:stagger = "" ;
double CSP_WQC_SGS(Time, bottom_top) ;
        CSP_WQC_SGS:FieldType = 105 ;
        CSP_WQC_SGS:MemoryOrder = "Z  " ;
        CSP_WQC_SGS:description = "Cloud water flux (sgs)" ;
        CSP_WQC_SGS:units = "kg/kg m/s" ;
        CSP_WQC_SGS:stagger = "" ;
double CSP_WQL(Time, bottom_top) ;
        CSP_WQL:FieldType = 105 ;
        CSP_WQL:MemoryOrder = "Z  " ;
        CSP_WQL:description = "Liquid water flux (rs+sgs)" ;
        CSP_WQL:units = "kg/kg m/s" ;
        CSP_WQL:stagger = "" ;
double CSP_WQL_SGS(Time, bottom_top) ;
        CSP_WQL_SGS:FieldType = 105 ;
        CSP_WQL_SGS:MemoryOrder = "Z  " ;
        CSP_WQL_SGS:description = "Liquid water flux (sgs)" ;
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        CSP_WQL_SGS:units = “kg/kg m/s” ;
        CSP_WQL_SGS:stagger = “” ;
double CSP_WQT(Time, bottom_top) ;
        CSP_WQT:FieldType = 105 ;
        CSP_WQT:MemoryOrder = “Z  “ ;
        CSP_WQT:description = “Total water flux (rs+sgs)” ;
        CSP_WQT:units = “kg/kg m/s” ;
        CSP_WQT:stagger = “” ;
double CSP_WQT_SGS(Time, bottom_top) ;
        CSP_WQT_SGS:FieldType = 105 ;
        CSP_WQT_SGS:MemoryOrder = “Z  “ ;
        CSP_WQT_SGS:description = “Total water flux (sgs)” ;
        CSP_WQT_SGS:units = “kg/kg m/s” ;
        CSP_WQT_SGS:stagger = “” ;
double CSP_WQV(Time, bottom_top) ;
        CSP_WQV:FieldType = 105 ;
        CSP_WQV:MemoryOrder = “Z  “ ;
        CSP_WQV:description = “Water vapor flux (rs+sgs)” ;
        CSP_WQV:units = “kg/kg m/s” ;
        CSP_WQV:stagger = “” ;
double CSP_WQV_SGS(Time, bottom_top) ;
        CSP_WQV_SGS:FieldType = 105 ;
        CSP_WQV_SGS:MemoryOrder = “Z  “ ;
        CSP_WQV_SGS:description = “Water vapor flux (sgs)” ;
        CSP_WQV_SGS:units = “kg/kg m/s” ;
        CSP_WQV_SGS:stagger = “” ;
double CSP_WSKEW(Time, bottom_top) ;
        CSP_WSKEW:FieldType = 105 ;
        CSP_WSKEW:MemoryOrder = “Z  “ ;
        CSP_WSKEW:description = “Skewness <w3>/<w2>^(3/2)” ;
        CSP_WSKEW:units = “” ;
        CSP_WSKEW:stagger = “” ;
double CSP_WTH(Time, bottom_top) ;
        CSP_WTH:FieldType = 105 ;
        CSP_WTH:MemoryOrder = “Z  “ ;
        CSP_WTH:description = “Potential temperature flux (rs+sgs)” ;
        CSP_WTH:units = “K m/s” ;
        CSP_WTH:stagger = “” ;
double CSP_WTHL(Time, bottom_top) ;
        CSP_WTHL:FieldType = 105 ;
        CSP_WTHL:MemoryOrder = “Z  “ ;
        CSP_WTHL:description = “Liquid water potential temperature flux (rs+sgs)” ;
        CSP_WTHL:units = “K m/s” ;
        CSP_WTHL:stagger = “” ;
double CSP_WTHL_SGS(Time, bottom_top) ;
        CSP_WTHL_SGS:FieldType = 105 ;
        CSP_WTHL_SGS:MemoryOrder = “Z  “ ;
        CSP_WTHL_SGS:description = “Liquid water potential temperature flux (sgs)” ;
        CSP_WTHL_SGS:units = “K m/s” ;
        CSP_WTHL_SGS:stagger = “” ;
double CSP_WTHV(Time, bottom_top) ;
        CSP_WTHV:FieldType = 105 ;
        CSP_WTHV:MemoryOrder = “Z  “ ;
        CSP_WTHV:description = “Virtual potential temperature flux (rs+sgs)” ;
        CSP_WTHV:units = “K m/s” ;
        CSP_WTHV:stagger = “” ;
double CSP_WTHV_SGS(Time, bottom_top) ;
        CSP_WTHV_SGS:FieldType = 105 ;
        CSP_WTHV_SGS:MemoryOrder = “Z  “ ;
        CSP_WTHV_SGS:description = “Virtual potential temperature flux (sgs)” ;
        CSP_WTHV_SGS:units = “K m/s” ;
        CSP_WTHV_SGS:stagger = “” ;
```

```
double CSP_WTH_SGS(Time, bottom_top) ;
        CSP_WTH_SGS:FieldType = 105 ;
        CSP_WTH_SGS:MemoryOrder = "Z  " ;
        CSP_WTH_SGS:description = "Potential temperature flux (sgs)" ;
        CSP_WTH_SGS:units = "K m/s" ;
        CSP_WTH_SGS:stagger = "" ;
double CSP_W_C(Time, bottom_top) ;
        CSP_W_C:FieldType = 105 ;
        CSP_W_C:MemoryOrder = "Z  " ;
        CSP_W_C:description = "Average over all cloudy grid points of w" ;
        CSP_W_C:units = "m/s" ;
        CSP_W_C:stagger = "" ;
double CSP_W_CC(Time, bottom_top) ;
        CSP_W_CC:FieldType = 105 ;
        CSP_W_CC:MemoryOrder = "Z  " ;
        CSP_W_CC:description = "Average over all cloudcore grid points of w" ;
        CSP_W_CC:units = "m/s" ;
        CSP_W_CC:stagger = "" ;
double CSP_Z(Time, bottom_top) ;
        CSP_Z:FieldType = 105 ;
        CSP_Z:MemoryOrder = "Z  " ;
        CSP_Z:description = "Half level height" ;
        CSP_Z:units = "m" ;
        CSP_Z:stagger = "" ;
double CSP_Z8W(Time, bottom_top) ;
        CSP_Z8W:FieldType = 105 ;
        CSP_Z8W:MemoryOrder = "Z  " ;
        CSP_Z8W:description = "Full level height" ;
        CSP_Z8W:units = "m" ;
        CSP_Z8W:stagger = "" ;
double CST_CLDTOT(Time) ;
        CST_CLDTOT:FieldType = 105 ;
        CST_CLDTOT:MemoryOrder = "0  " ;
        CST_CLDTOT:description = "Fractional cloud cover" ;
        CST_CLDTOT:units = "(0-1)" ;
        CST_CLDTOT:stagger = "" ;
double CST_FLNS(Time) ;
        CST_FLNS:FieldType = 105 ;
        CST_FLNS:MemoryOrder = "0  " ;
        CST_FLNS:description = "Surface LW net upward total-sky radiation" ;
        CST_FLNS:units = "W/m^2" ;
        CST_FLNS:stagger = "" ;
double CST_FLNSC(Time) ;
        CST_FLNSC:FieldType = 105 ;
        CST_FLNSC:MemoryOrder = "0  " ;
        CST_FLNSC:description = "Surface LW net upward clear-sky radiation" ;
        CST_FLNSC:units = "W/m^2" ;
        CST_FLNSC:stagger = "" ;
double CST_FLNT(Time) ;
        CST_FLNT:FieldType = 105 ;
        CST_FLNT:MemoryOrder = "0  " ;
        CST_FLNT:description = "TOA LW (net) upward total-sky radiation" ;
        CST_FLNT:units = "W/m^2" ;
        CST_FLNT:stagger = "" ;
double CST_FLNTC(Time) ;
        CST_FLNTC:FieldType = 105 ;
        CST_FLNTC:MemoryOrder = "0  " ;
        CST_FLNTC:description = "TOA LW (net) upward clear-sky radiation" ;
        CST_FLNTC:units = "W/m^2" ;
        CST_FLNTC:stagger = "" ;
double CST_FSNS(Time) ;
        CST_FSNS:FieldType = 105 ;
```

```
            CST_FSNS:MemoryOrder = “0  “ ;
            CST_FSNS:description = “Surface SW net upward total-sky radiation” ;
            CST_FSNS:units = “W/m^2” ;
            CST_FSNS:stagger = “” ;
double CST_FSNSC(Time) ;
            CST_FSNSC:FieldType = 105 ;
            CST_FSNSC:MemoryOrder = “0  “ ;
            CST_FSNSC:description = “Surface SW net upward clear-sky radiation” ;
            CST_FSNSC:units = “W/m^2” ;
            CST_FSNSC:stagger = “” ;
double CST_FSNT(Time) ;
            CST_FSNT:FieldType = 105 ;
            CST_FSNT:MemoryOrder = “0  “ ;
            CST_FSNT:description = “TOA SW net upward total-sky radiation” ;
            CST_FSNT:units = “W/m^2” ;
            CST_FSNT:stagger = “” ;
double CST_FSNTC(Time) ;
            CST_FSNTC:FieldType = 105 ;
            CST_FSNTC:MemoryOrder = “0  “ ;
            CST_FSNTC:description = “TOA SW net upward clear-sky radiation” ;
            CST_FSNTC:units = “W/m^2” ;
            CST_FSNTC:stagger = “” ;
double CST_HOUR(Time) ;
            CST_HOUR:FieldType = 105 ;
            CST_HOUR:MemoryOrder = “0  “ ;
            CST_HOUR:description = “Time in hour since simulation start” ;
            CST_HOUR:units = “hour” ;
            CST_HOUR:stagger = “” ;
double CST_LH(Time) ;
            CST_LH:FieldType = 105 ;
            CST_LH:MemoryOrder = “0  “ ;
            CST_LH:description = “Surface sensible heat flux” ;
            CST_LH:units = “W/m^2” ;
            CST_LH:stagger = “” ;
double CST_LWP(Time) ;
            CST_LWP:FieldType = 105 ;
            CST_LWP:MemoryOrder = “0  “ ;
            CST_LWP:description = “Vertical integrated liquid water” ;
            CST_LWP:units = “kg/m^2” ;
            CST_LWP:stagger = “” ;
double CST_PRECT(Time) ;
            CST_PRECT:FieldType = 105 ;
            CST_PRECT:MemoryOrder = “0  “ ;
            CST_PRECT:description = “Total precipitation at surface” ;
            CST_PRECT:units = “mm/sec” ;
            CST_PRECT:stagger = “” ;
double CST_PRECW(Time) ;
            CST_PRECW:FieldType = 105 ;
            CST_PRECW:MemoryOrder = “0  “ ;
            CST_PRECW:description = “Vertical integrated water vapor” ;
            CST_PRECW:units = “kg/m^2” ;
            CST_PRECW:stagger = “” ;
double CST_PS(Time) ;
            CST_PS:FieldType = 105 ;
            CST_PS:MemoryOrder = “0  “ ;
            CST_PS:description = “Surface pressure” ;
            CST_PS:units = “Pa” ;
            CST_PS:stagger = “” ;
double CST_SH(Time) ;
            CST_SH:FieldType = 105 ;
            CST_SH:MemoryOrder = “0  “ ;
            CST_SH:description = “Surface latent heat flux” ;
```

```
                CST_SH:units = “W/m^2” ;
                CST_SH:stagger = “” ;
        double CST_SWINC(Time) ;
                CST_SWINC:FieldType = 105 ;
                CST_SWINC:MemoryOrder = “0  “ ;
                CST_SWINC:description = “TOA solar insolation” ;
                CST_SWINC:units = “W/m^2” ;
                CST_SWINC:stagger = “” ;
        double CST_TKE(Time) ;
                CST_TKE:FieldType = 105 ;
                CST_TKE:MemoryOrder = “0  “ ;
                CST_TKE:description = “Vertical integrated TKE” ;
                CST_TKE:units = “kg/s^2” ;
                CST_TKE:stagger = “” ;
        double CST_TSAIR(Time) ;
                CST_TSAIR:FieldType = 105 ;
                CST_TSAIR:MemoryOrder = “0  “ ;
                CST_TSAIR:description = “Surface air temperature” ;
                CST_TSAIR:units = “K” ;
                CST_TSAIR:stagger = “” ;
        double CST_TSK(Time) ;
                CST_TSK:FieldType = 105 ;
                CST_TSK:MemoryOrder = “0  “ ;
                CST_TSK:description = “Surface skin temperature” ;
                CST_TSK:units = “K” ;
                CST_TSK:stagger = “” ;
        double CST_UST(Time) ;
                CST_UST:FieldType = 105 ;
                CST_UST:MemoryOrder = “0  “ ;
                CST_UST:description = “Surface friction velocity” ;
                CST_UST:units = “m/s” ;
                CST_UST:stagger = “” ;
        int ITIMESTEP(Time) ;
                ITIMESTEP:FieldType = 106 ;
                ITIMESTEP:MemoryOrder = “0  “ ;
                ITIMESTEP:description = “” ;
                ITIMESTEP:units = “” ;
                ITIMESTEP:stagger = “” ;
        char Times(Time, DateStrLen) ;
        double XTIME(Time) ;
                XTIME:FieldType = 105 ;
                XTIME:MemoryOrder = “0  “ ;
                XTIME:description = “minutes since 2015-06-06 12:00:00” ;
                XTIME:units = “minutes since 2015-06-06 12:00:00” ;
                XTIME:stagger = “” ;

// global attributes:
                :TITLE = “ OUTPUT FROM WRF V3.7 MODEL” ;
                :START_DATE = “2015-06-06_12:00:00” ;
                :SIMULATION_START_DATE = “2015-06-06_12:00:00” ;
                :WEST-EAST_GRID_DIMENSION = 257 ;
                :SOUTH-NORTH_GRID_DIMENSION = 257 ;
                :BOTTOM-TOP_GRID_DIMENSION = 337 ;
                :DX = 100. ;
                :DY = 100. ;
                :SKEBS_ON = 0 ;
                :SPEC_BDY_FINAL_MU = 0 ;
                :USE_Q_DIABATIC = 0 ;
                :GRIDTYPE = “C” ;
                :DIFF_OPT = 2 ;
                :KM_OPT = 2 ;
                :DAMP_OPT = 3 ;
```

```
:DAMPCOEF = 0.2 ;
:KHDIF = 1. ;
:KVDIF = 1. ;
:MP_PHYSICS = 10 ;
:RA_LW_PHYSICS = 4 ;
:RA_SW_PHYSICS = 4 ;
:SF_SFCLAY_PHYSICS = 1 ;
:SF_SURFACE_PHYSICS = 0 ;
:BL_PBL_PHYSICS = 0 ;
:CU_PHYSICS = 0 ;
:SF_LAKE_PHYSICS = 0 ;
:SURFACE_INPUT_SOURCE = 1 ;
:SST_UPDATE = 0 ;
:GRID_FDDA = 0 ;
:GFDDA_INTERVAL_M = 0 ;
:GFDDA_END_H = 0 ;
:GRID_SFDDA = 0 ;
:SGFDDA_INTERVAL_M = 0 ;
:SGFDDA_END_H = 0 ;
:HYPSOMETRIC_OPT = 1 ;
:USE_THETA_M = 1 ;
:SF_URBAN_PHYSICS = 0 ;
:SHCU_PHYSICS = 0 ;
:MFSHCONV = 0 ;
:FEEDBACK = 0 ;
:SMOOTH_OPTION = 1 ;
:SWRAD_SCAT = 1. ;
:W_DAMPING = 0 ;
:DT = 1. ;
:RADT = 1. ;
:BLDT = 0. ;
:CUDT = 5. ;
:AER_OPT = 0 ;
:SWINT_OPT = 0 ;
:AER_TYPE = 1 ;
:AER_AOD550_OPT = 1 ;
:AER_ANGEXP_OPT = 1 ;
:AER_SSA_OPT = 1 ;
:AER_ASY_OPT = 1 ;
:AER_AOD550_VAL = 0.12 ;
:AER_ANGEXP_VAL = 1.3 ;
:AER_SSA_VAL = 4.94065645841247e-324 ;
:AER_ASY_VAL = 4.94065645841247e-324 ;
:MOIST_ADV_OPT = 2 ;
:SCALAR_ADV_OPT = 2 ;
:TKE_ADV_OPT = 2 ;
:DIFF_6TH_OPT = 0 ;
:DIFF_6TH_FACTOR = 0.12 ;
:OBS_NUDGE_OPT = 0 ;
:BUCKET_MM = -1. ;
:BUCKET_J = -1. ;
:PREC_ACC_DT = 0. ;
:SF_OCEAN_PHYSICS = 0 ;
:ISFTCFLX = 0 ;
:ISHALLOW = 0 ;
:ISFFLX = 11 ;
:ICLOUD = 1 ;
:ICLOUD_CU = 0 ;
:TRACER_PBLMIX = 1 ;
:SCALAR_PBLMIX = 0 ;
:YSU_TOPDOWN_PBLMIX = 0 ;
:GRAV_SETTLING = 0 ;
```

:DFI_OPT = 0 ;
:SIMULATION_INITIALIZATION_TYPE = “IDEALIZED DATA” ;
:WEST-EAST_PATCH_START_UNSTAG = 1 ;
:WEST-EAST_PATCH_END_UNSTAG = 256 ;
:WEST-EAST_PATCH_START_STAG = 1 ;
:WEST-EAST_PATCH_END_STAG = 257 ;
:SOUTH-NORTH_PATCH_START_UNSTAG = 1 ;
:SOUTH-NORTH_PATCH_END_UNSTAG = 256 ;
:SOUTH-NORTH_PATCH_START_STAG = 1 ;
:SOUTH-NORTH_PATCH_END_STAG = 257 ;
:BOTTOM-TOP_PATCH_START_UNSTAG = 1 ;
:BOTTOM-TOP_PATCH_END_UNSTAG = 336 ;
:BOTTOM-TOP_PATCH_START_STAG = 1 ;
:BOTTOM-TOP_PATCH_END_STAG = 337 ;
:GRID_ID = 1 ;
:PARENT_ID = 0 ;
:I_PARENT_START = 1 ;
:J_PARENT_START = 1 ;
:PARENT_GRID_RATIO = 1 ;
:CEN_LAT = 0. ;
:CEN_LON = 0. ;
:TRUELAT1 = 0. ;
:TRUELAT2 = 0. ;
:MOAD_CEN_LAT = 0. ;
:STAND_LON = 0. ;
:POLE_LAT = 0. ;
:POLE_LON = 0. ;
:GMT = 0. ;
:JULYR = 0 ;
:JULDAY = 1 ;
:MAP_PROJ = 0 ;
:MAP_PROJ_CHAR = “Cartesian” ;
:MMINLU = “” ;
:NUM_LAND_CAT = 24 ;
:ISWATER = 16 ;
:ISLAKE = 0 ;
:ISICE = 0 ;
:ISURBAN = 0 ;
:ISOILWATER = 0 ;
:doi = “10.5439/1256454” ;
:contacts = “LASSO PI: William Gustafson (William.Gustafson@pnnl.gov), LASSO Co-PI: Andrew Vogelmann (vogelmann@bnl.gov)” ;
:process_version = “Evaluation Version” ;
:site_id = “sgp” ;
:facility_id = “C1” ;
:location_description = “Southern Great Plains (SGP), Lamont, Oklahoma” ;
:simulation_id_number = 1 ;
:model_type = “WRF” ;
:model_version = “3.7” ;
:output_domain_size = “25.6 km” ;
:output_start_datetime = “20150606.120000 UTC” ;
:config_forecast_time = “15 hours” ;
:config_boundary_method = “periodic” ;
:config_microphysics = “Morrison” ;
:config_large_scale_forcing = “VARANAL” ;
:config_large_scale_forcing_scale = “300 km” ;
:config_large_scale_forcing_specifics = “VARANARAP LAND” ;
:output_horizontal_grid_spacing = “100 m” ;
:output_number_of_levels = “336 levels” ;
:config_surface_treatment = “VARANAL” ;
:config_surface_treatment_specifics = “VARANARAP LAND” ;
:config_initial_condition = “SONDE” ;

```
                :config_initial_condition_specifics = "SONDE" ;
                :config_aerosol = "constant" ;
                :config_comments = "AGU run; contains random number seed repetition feature in initial conditions (minimal
impact to clouds)" ;
                :config_nickname = "runlas150606aguvar1" ;
                :history = "Sat Jun 25 21:32:20 2016: ncks -O --fl_fmt=netcdf4 --deflate=2 -v Times,XTIME,ITIMESTEP,^C-
ST_,^CSP_ /lustre/atlas1/cli120/proj-shared/d3m088/alpha1release/lasso-alpha1_release/sgplassodiagobsmodC1.c1/20150606/
sim0001/raw_model/wrfout_d01_2015-06-06_12:00:00.nc /lustre/atlas1/cli120/proj-shared/d3m088/alpha1release/lasso-alpha1_re-
lease/sgplassodiagobsmodC1.c1/20150606/sim0001/raw_model/wrfstat_d01_2015-06-06_12:00:00.nc" ;
                :NCO = "4.3.9" ;
}
```

File: .../20150606/sim0003/raw_model/sgp20150606_agu.varanal_ls.varanal_sf.varanal_init.nc

Description: 1-D SAM output averaged between output times. The time label represents the middle of the averaging period.

```
netcdf sgp20150606_agu.varanal_ls.varanal_sf.varanal_init {
dimensions:
        time = 180 ;
        z = 337 ;
variables:
        float ADVTR(time, z) ;
                ADVTR:long_name = "Turbulent advective transport of TKE (Resolved)" ;
                ADVTR:units = "m2/s3" ;
                ADVTR:missing_value = -9999.f ;
        float ADVTRS(time, z) ;
                ADVTRS:long_name = "Turbulent+pressure transport of TKE (SGS)" ;
                ADVTRS:units = "m2/s3" ;
                ADVTRS:missing_value = -9999.f ;
        float AREAPREC(time) ;
                AREAPREC:long_name = "Surface Precip. Fraction" ;
                AREAPREC:units = "" ;
        float AREAPRTHR(time) ;
                AREAPRTHR:long_name = "GCSS Precip. over threshold Area Fraction" ;
                AREAPRTHR:units = "" ;
                AREAPRTHR:_FillValue = -1.f ;
        float AUP(time, z) ;
                AUP:long_name = "domain fraction occupied by updrafts" ;
                AUP:units = "" ;
                AUP:missing_value = -9999.f ;
        float BUOYA(time, z) ;
                BUOYA:long_name = "Buoyancy production of TKE (resolved)" ;
                BUOYA:units = "m2/s3" ;
                BUOYA:missing_value = -9999.f ;
        float BUOYAS(time, z) ;
                BUOYAS:long_name = "Buoyancy production of TKE (SGS)" ;
                BUOYAS:units = "m2/s3" ;
                BUOYAS:missing_value = -9999.f ;
        float CAPE(time) ;
                CAPE:long_name = "CAPE" ;
                CAPE:units = "J/kg" ;
        float CAPEOBS(time) ;
                CAPEOBS:long_name = "CAPEOBS" ;
                CAPEOBS:units = "J/kg" ;
        float CDN(time, z) ;
                CDN:long_name = "downdraft core Fraction" ;
                CDN:units = "" ;
                CDN:missing_value = -9999.f ;
        float CIN(time) ;
```

```
            CIN:long_name = “CIN” ;
            CIN:units = “J/kg” ;
float CINOBS(time) ;
            CINOBS:long_name = “CINOBS” ;
            CINOBS:units = “J/kg” ;
float CLD(time, z) ;
            CLD:long_name = “cloud Fraction” ;
            CLD:units = “” ;
            CLD:missing_value = -9999.f ;
float CLD245(time) ;
            CLD245:long_name = “Cloud Fraction above 245K level” ;
            CLD245:units = “” ;
float CLDHI(time) ;
            CLDHI:long_name = “High Cloud Fraction” ;
            CLDHI:units = “” ;
float CLDLOW(time) ;
            CLDLOW:long_name = “Low Cloud Fraction” ;
            CLDLOW:units = “” ;
float CLDMID(time) ;
            CLDMID:long_name = “Middle Cloud Fraction” ;
            CLDMID:units = “” ;
float CLDSHD(time) ;
            CLDSHD:long_name = “Shaded Cloud Fraction” ;
            CLDSHD:units = “” ;
float COR(time, z) ;
            COR:long_name = “core Fraction” ;
            COR:units = “” ;
            COR:missing_value = -9999.f ;
float CORECL(time, z) ;
            CORECL:long_name = “Cloudy Updraft core fraction” ;
            CORECL:units = “” ;
            CORECL:missing_value = -9999.f ;
float COREDNCL(time, z) ;
            COREDNCL:long_name = “Cloudy Downdraft core fraction” ;
            COREDNCL:units = “” ;
            COREDNCL:missing_value = -9999.f ;
float CWP(time) ;
            CWP:long_name = “Cloud Water Path” ;
            CWP:units = “g/m2” ;
float DIFTR(time, z) ;
            DIFTR:long_name = “SGS transport of TKE (Resolved)” ;
            DIFTR:units = “m2/s3” ;
            DIFTR:missing_value = -9999.f ;
float DISSIP(time, z) ;
            DISSIP:long_name = “Dissipation (Resolved)” ;
            DISSIP:units = “m2/s3” ;
            DISSIP:missing_value = -9999.f ;
float DISSIPS(time, z) ;
            DISSIPS:long_name = “Dissipation (SGS)” ;
            DISSIPS:units = “m2/s3” ;
            DISSIPS:missing_value = -9999.f ;
float DSE(time, z) ;
            DSE:long_name = “Dry static energy” ;
            DSE:units = “K” ;
            DSE:missing_value = -9999.f ;
float DSECDN(time, z) ;
            DSECDN:long_name = “Mean dry static energy in downdraft core” ;
            DSECDN:units = “K” ;
            DSECDN:missing_value = -9999.f ;
float DSECLD(time, z) ;
            DSECLD:long_name = “Mean dry static energy in cloud” ;
            DSECLD:units = “K” ;
```

```
        DSECLD:missing_value = -9999.f ;
float DSECOR(time, z) ;
        DSECOR:long_name = “Mean dry static energy in core” ;
        DSECOR:units = “K” ;
        DSECOR:missing_value = -9999.f ;
float DSEENV(time, z) ;
        DSEENV:long_name = “Mean dry static energy in unsaturated environment” ;
        DSEENV:units = “K” ;
        DSEENV:missing_value = -9999.f ;
float DSESDN(time, z) ;
        DSESDN:long_name = “Mean dry static energy in saturated downdrafts” ;
        DSESDN:units = “K” ;
        DSESDN:missing_value = -9999.f ;
float DSESUP(time, z) ;
        DSESUP:long_name = “Mean dry static energy in saturated updrafts” ;
        DSESUP:units = “K” ;
        DSESUP:missing_value = -9999.f ;
float ENV(time, z) ;
        ENV:long_name = “unsaturated environment Fraction” ;
        ENV:units = “” ;
        ENV:missing_value = -9999.f ;
float GWP(time) ;
        GWP:long_name = “Grauple Water Path” ;
        GWP:units = “g/m2” ;
float HFCDN(time, z) ;
        HFCDN:long_name = “Mean Frozen MSE in downdraft core” ;
        HFCDN:units = “K” ;
        HFCDN:missing_value = -9999.f ;
float HFCDNA(time, z) ;
        HFCDNA:long_name = “Mean Frozen MSE anomaly in downdraft core” ;
        HFCDNA:units = “K” ;
        HFCDNA:missing_value = -9999.f ;
float HFCLD(time, z) ;
        HFCLD:long_name = “Mean Frozen MSE in cloud” ;
        HFCLD:units = “K” ;
        HFCLD:missing_value = -9999.f ;
float HFCLDA(time, z) ;
        HFCLDA:long_name = “Mean Frozen MSE anomaly in cloud” ;
        HFCLDA:units = “K” ;
        HFCLDA:missing_value = -9999.f ;
float HFCOR(time, z) ;
        HFCOR:long_name = “Mean Frozen MSE in core” ;
        HFCOR:units = “K” ;
        HFCOR:missing_value = -9999.f ;
float HFCORA(time, z) ;
        HFCORA:long_name = “Mean Frozen MSE anomaly in core” ;
        HFCORA:units = “K” ;
        HFCORA:missing_value = -9999.f ;
float HFENV(time, z) ;
        HFENV:long_name = “Mean Frozen MSE in unsaturated environment” ;
        HFENV:units = “K” ;
        HFENV:missing_value = -9999.f ;
float HFENVA(time, z) ;
        HFENVA:long_name = “Mean Frozen MSE anomaly in unsaturated environment” ;
        HFENVA:units = “K” ;
        HFENVA:missing_value = -9999.f ;
float HFSDN(time, z) ;
        HFSDN:long_name = “Mean Frozen MSE in saturated downdrafts” ;
        HFSDN:units = “K” ;
        HFSDN:missing_value = -9999.f ;
float HFSDNA(time, z) ;
        HFSDNA:long_name = “Mean Frozen MSE anomaly in saturated downdrafts” ;
```

```
        HFSDNA:units = “K” ;
        HFSDNA:missing_value = -9999.f ;
float HFSUP(time, z) ;
        HFSUP:long_name = “Mean Frozen MSE in saturated updrafts” ;
        HFSUP:units = “K” ;
        HFSUP:missing_value = -9999.f ;
float HFSUPA(time, z) ;
        HFSUPA:long_name = “Mean Frozen MSE anomaly in saturated updrafts” ;
        HFSUPA:units = “K” ;
        HFSUPA:missing_value = -9999.f ;
float HLADV(time, z) ;
        HLADV:long_name = “Advective Transport of HL” ;
        HLADV:units = “K/day” ;
        HLADV:missing_value = -9999.f ;
float HLDIFF(time, z) ;
        HLDIFF:long_name = “Diffusive Transport of HL” ;
        HLDIFF:units = “K/day” ;
        HLDIFF:missing_value = -9999.f ;
float HLLAT(time, z) ;
        HLLAT:long_name = “Latent Heating of HL” ;
        HLLAT:units = “K/day” ;
        HLLAT:missing_value = -9999.f ;
float HLRAD(time, z) ;
        HLRAD:long_name = “Radiative Heating of HL” ;
        HLRAD:units = “K/day” ;
        HLRAD:missing_value = -9999.f ;
float HLSTOR(time, z) ;
        HLSTOR:long_name = “Liquid-ice static energy storage” ;
        HLSTOR:units = “K/day” ;
        HLSTOR:missing_value = -9999.f ;
float HYDRO(time, z) ;
        HYDRO:long_name = “Total fraction of hydrometeors” ;
        HYDRO:units = “” ;
        HYDRO:missing_value = -9999.f ;
float ISCCPALB(time) ;
        ISCCPALB:long_name = “ISCCP Cloud Albedo” ;
        ISCCPALB:units = “” ;
        ISCCPALB:_FillValue = -1.f ;
float ISCCPHGH(time) ;
        ISCCPHGH:long_name = “ISCCP High Cloud Fraction (tau > 0.3)” ;
        ISCCPHGH:units = “” ;
        ISCCPHGH:_FillValue = -1.f ;
float ISCCPLOW(time) ;
        ISCCPLOW:long_name = “ISCCP Low Cloud Fraction (tau > 0.3)” ;
        ISCCPLOW:units = “” ;
        ISCCPLOW:_FillValue = -1.f ;
float ISCCPMID(time) ;
        ISCCPMID:long_name = “ISCCP Middle Cloud Fraction (tau > 0.3)” ;
        ISCCPMID:units = “” ;
        ISCCPMID:_FillValue = -1.f ;
float ISCCPPTOP(time) ;
        ISCCPPTOP:long_name = “ISCCP Cloud-Top Pressure” ;
        ISCCPPTOP:units = “mb” ;
        ISCCPPTOP:_FillValue = -1.f ;
float ISCCPTAU(time) ;
        ISCCPTAU:long_name = “ISCCP Optical Path” ;
        ISCCPTAU:units = “” ;
        ISCCPTAU:_FillValue = -1.f ;
float ISCCPTB(time) ;
        ISCCPTB:long_name = “ISCCP Brightness Temperature” ;
        ISCCPTB:units = “K” ;
        ISCCPTB:_FillValue = -1.f ;
```

```
float ISCCPTBCLR(time) ;
        ISCCPTBCLR:long_name = “ISCCP Brightness Temperature (Clear Sky)” ;
        ISCCPTBCLR:units = “K” ;
        ISCCPTBCLR:_FillValue = -1.f ;
float ISCCPTOT(time) ;
        ISCCPTOT:long_name = “ISCCP Total Cloud Fraction (tau > 0.3)” ;
        ISCCPTOT:units = “” ;
        ISCCPTOT:_FillValue = -1.f ;
float IWP(time) ;
        IWP:long_name = “Ice Water Path” ;
        IWP:units = “g/m2” ;
float LHF(time) ;
        LHF:long_name = “Latent Heat Flux” ;
        LHF:units = “W/m2” ;
float LHFOBS(time) ;
        LHFOBS:long_name = “Observed Latent Heat Flux” ;
        LHFOBS:units = “W/m2” ;
float LWDS(time) ;
        LWDS:long_name = “Downward LW flux at sfc” ;
        LWDS:units = “W/m2” ;
float LWNS(time) ;
        LWNS:long_name = “Net LW flux at sfc” ;
        LWNS:units = “W/m2” ;
float LWNSC(time) ;
        LWNSC:long_name = “Net LW flux at sfc (Clear Sky)” ;
        LWNSC:units = “W/m2” ;
float LWNT(time) ;
        LWNT:long_name = “Net LW flux at Top-of-Model)” ;
        LWNT:units = “W/m2” ;
float LWNTOA(time) ;
        LWNTOA:long_name = “Net LW flux at TOA” ;
        LWNTOA:units = “W/m2” ;
float LWNTOAC(time) ;
        LWNTOAC:long_name = “Net LW flux at TOA (Clear Sky)” ;
        LWNTOAC:units = “W/m2” ;
float LWP(time) ;
        LWP:long_name = “GCSS Liquid Water Path” ;
        LWP:units = “g/m2” ;
        LWP:_FillValue = -1.f ;
float LWP2(time) ;
        LWP2:long_name = “GCSS Variance of Liquid Water Path” ;
        LWP2:units = “(g/m2)^2” ;
        LWP2:_FillValue = -1.f ;
float MC(time, z) ;
        MC:long_name = “Cloud mass flux” ;
        MC:units = “kg/m2/s” ;
        MC:missing_value = -9999.f ;
float MCDNS(time, z) ;
        MCDNS:long_name = “Downdraft saturated cloud mass flux” ;
        MCDNS:units = “kg/m2/s” ;
        MCDNS:missing_value = -9999.f ;
float MCDNU(time, z) ;
        MCDNU:long_name = “Downdraft unsaturated mass flux” ;
        MCDNU:units = “kg/m2/s” ;
        MCDNU:missing_value = -9999.f ;
float MCR(time, z) ;
        MCR:long_name = “Core mass flux” ;
        MCR:units = “kg/m2/s” ;
        MCR:missing_value = -9999.f ;
float MCRDNS(time, z) ;
        MCRDNS:long_name = “Downdraft cloud core mass flux” ;
        MCRDNS:units = “kg/m2/s” ;
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            MCRDNS:missing_value = -9999.f ;
    float MCRDNU(time, z) ;
            MCRDNU:long_name = “Downdraft unsaturated core mass flux” ;
            MCRDNU:units = “kg/m2/s” ;
            MCRDNU:missing_value = -9999.f ;
    float MCRUP(time, z) ;
            MCRUP:long_name = “Updraft core mass flux” ;
            MCRUP:units = “kg/m2/s” ;
            MCRUP:missing_value = -9999.f ;
    float MCUP(time, z) ;
            MCUP:long_name = “Updraft cloud mass flux” ;
            MCUP:units = “kg/m2/s” ;
            MCUP:missing_value = -9999.f ;
    float MFCDN(time, z) ;
            MFCDN:long_name = “Mass flux in downdraft core averaged over the whole domain” ;
            MFCDN:units = “kg/m2/s” ;
            MFCDN:missing_value = -9999.f ;
    float MFCLD(time, z) ;
            MFCLD:long_name = “Mass flux in cloud averaged over the whole domain” ;
            MFCLD:units = “kg/m2/s” ;
            MFCLD:missing_value = -9999.f ;
    float MFCOR(time, z) ;
            MFCOR:long_name = “Mass flux in core averaged over the whole domain” ;
            MFCOR:units = “kg/m2/s” ;
            MFCOR:missing_value = -9999.f ;
    float MFENV(time, z) ;
            MFENV:long_name = “Mass flux in unsaturated environment averaged over the whole domain” ;
            MFENV:units = “kg/m2/s” ;
            MFENV:missing_value = -9999.f ;
    float MFHCDN(time, z) ;
            MFHCDN:long_name = “RHO*W*HF in downdraft core averaged over the whole domain” ;
            MFHCDN:units = “K kg/m2/s” ;
            MFHCDN:missing_value = -9999.f ;
    float MFHCDNA(time, z) ;
            MFHCDNA:long_name = “RHO*W*HF anomaly in downdraft core averaged over the whole domain” ;
            MFHCDNA:units = “K kg/m2/s” ;
            MFHCDNA:missing_value = -9999.f ;
    float MFHCLD(time, z) ;
            MFHCLD:long_name = “RHO*W*HF in cloud averaged over the whole domain” ;
            MFHCLD:units = “K kg/m2/s” ;
            MFHCLD:missing_value = -9999.f ;
    float MFHCLDA(time, z) ;
            MFHCLDA:long_name = “RHO*W*HF anomaly in cloud averaged over the whole domain” ;
            MFHCLDA:units = “K kg/m2/s” ;
            MFHCLDA:missing_value = -9999.f ;
    float MFHCOR(time, z) ;
            MFHCOR:long_name = “RHO*W*HF in core averaged over the whole domain” ;
            MFHCOR:units = “K kg/m2/s” ;
            MFHCOR:missing_value = -9999.f ;
    float MFHCORA(time, z) ;
            MFHCORA:long_name = “RHO*W*HF anomaly in core averaged over the whole domain” ;
            MFHCORA:units = “K kg/m2/s” ;
            MFHCORA:missing_value = -9999.f ;
    float MFHENV(time, z) ;
            MFHENV:long_name = “RHO*W*HF in unsaturated environment averaged over the whole domain” ;
            MFHENV:units = “K kg/m2/s” ;
            MFHENV:missing_value = -9999.f ;
    float MFHENVA(time, z) ;
            MFHENVA:long_name = “RHO*W*HF anomaly in unsaturated environment averaged over the whole domain”
;
            MFHENVA:units = “K kg/m2/s” ;
            MFHENVA:missing_value = -9999.f ;
```

```
float MFHSDN(time, z) ;
        MFHSDN:long_name = "RHO*W*HF in saturated downdrafts averaged over the whole domain" ;
        MFHSDN:units = "K kg/m2/s" ;
        MFHSDN:missing_value = -9999.f ;
float MFHSDNA(time, z) ;
        MFHSDNA:long_name = "RHO*W*HF anomaly in saturated downdrafts averaged over the whole domain" ;
        MFHSDNA:units = "K kg/m2/s" ;
        MFHSDNA:missing_value = -9999.f ;
float MFHSUP(time, z) ;
        MFHSUP:long_name = "RHO*W*HF in saturated updrafts averaged over the whole domain" ;
        MFHSUP:units = "K kg/m2/s" ;
        MFHSUP:missing_value = -9999.f ;
float MFHSUPA(time, z) ;
        MFHSUPA:long_name = "RHO*W*HF anomaly in saturated updrafts averaged over the whole domain" ;
        MFHSUPA:units = "K kg/m2/s" ;
        MFHSUPA:missing_value = -9999.f ;
float MFQTCDN(time, z) ;
        MFQTCDN:long_name = "RHO*W*QT in downdraft core averaged over the whole domain" ;
        MFQTCDN:units = "g/m2/s" ;
        MFQTCDN:missing_value = -9999.f ;
float MFQTCDNA(time, z) ;
        MFQTCDNA:long_name = "RHO*W*QT anomaly in downdraft core averaged over the whole domain" ;
        MFQTCDNA:units = "g/m2/s" ;
        MFQTCDNA:missing_value = -9999.f ;
float MFQTCLD(time, z) ;
        MFQTCLD:long_name = "RHO*W*QT in cloud averaged over the whole domain" ;
        MFQTCLD:units = "g/m2/s" ;
        MFQTCLD:missing_value = -9999.f ;
float MFQTCLDA(time, z) ;
        MFQTCLDA:long_name = "RHO*W*QT anomaly in cloud averaged over the whole domain" ;
        MFQTCLDA:units = "g/m2/s" ;
        MFQTCLDA:missing_value = -9999.f ;
float MFQTCOR(time, z) ;
        MFQTCOR:long_name = "RHO*W*QT in core averaged over the whole domain" ;
        MFQTCOR:units = "g/m2/s" ;
        MFQTCOR:missing_value = -9999.f ;
float MFQTCORA(time, z) ;
        MFQTCORA:long_name = "RHO*W*QT anomaly in core averaged over the whole domain" ;
        MFQTCORA:units = "g/m2/s" ;
        MFQTCORA:missing_value = -9999.f ;
float MFQTENV(time, z) ;
        MFQTENV:long_name = "RHO*W*QT in unsaturated environment averaged over the whole domain" ;
        MFQTENV:units = "g/m2/s" ;
        MFQTENV:missing_value = -9999.f ;
float MFQTENVA(time, z) ;
        MFQTENVA:long_name = "RHO*W*QT anomaly in unsaturated environment averaged over the whole do-
main" ;
        MFQTENVA:units = "g/m2/s" ;
        MFQTENVA:missing_value = -9999.f ;
float MFQTSDN(time, z) ;
        MFQTSDN:long_name = "RHO*W*QT in saturated downdrafts averaged over the whole domain" ;
        MFQTSDN:units = "g/m2/s" ;
        MFQTSDN:missing_value = -9999.f ;
float MFQTSDNA(time, z) ;
        MFQTSDNA:long_name = "RHO*W*QT anomaly in saturated downdrafts averaged over the whole domain" ;
        MFQTSDNA:units = "g/m2/s" ;
        MFQTSDNA:missing_value = -9999.f ;
float MFQTSUP(time, z) ;
        MFQTSUP:long_name = "RHO*W*QT in saturated updrafts averaged over the whole domain" ;
        MFQTSUP:units = "g/m2/s" ;
        MFQTSUP:missing_value = -9999.f ;
float MFQTSUPA(time, z) ;
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            MFQTSUPA:long_name = “RHO*W*QT anomaly in saturated updrafts averaged over the whole domain” ;
            MFQTSUPA:units = “g/m2/s” ;
            MFQTSUPA:missing_value = -9999.f ;
      float MFSDN(time, z) ;
            MFSDN:long_name = “Mass flux in saturated downdrafts averaged over the whole domain” ;
            MFSDN:units = “kg/m2/s” ;
            MFSDN:missing_value = -9999.f ;
      float MFSUP(time, z) ;
            MFSUP:long_name = “Mass flux in saturated updrafts averaged over the whole domain” ;
            MFSUP:units = “kg/m2/s” ;
            MFSUP:missing_value = -9999.f ;
      float MFTLCDN(time, z) ;
            MFTLCDN:long_name = “RHO*W*TL in downdraft core averaged over the whole domain” ;
            MFTLCDN:units = “K kg/m2/s” ;
            MFTLCDN:missing_value = -9999.f ;
      float MFTLCDNA(time, z) ;
            MFTLCDNA:long_name = “RHO*W*TL anomaly in downdraft core averaged over the whole domain” ;
            MFTLCDNA:units = “K kg/m2/s” ;
            MFTLCDNA:missing_value = -9999.f ;
      float MFTLCLD(time, z) ;
            MFTLCLD:long_name = “RHO*W*TL in cloud averaged over the whole domain” ;
            MFTLCLD:units = “K kg/m2/s” ;
            MFTLCLD:missing_value = -9999.f ;
      float MFTLCLDA(time, z) ;
            MFTLCLDA:long_name = “RHO*W*TL anomaly in cloud averaged over the whole domain” ;
            MFTLCLDA:units = “K kg/m2/s” ;
            MFTLCLDA:missing_value = -9999.f ;
      float MFTLCOR(time, z) ;
            MFTLCOR:long_name = “RHO*W*TL in core averaged over the whole domain” ;
            MFTLCOR:units = “K kg/m2/s” ;
            MFTLCOR:missing_value = -9999.f ;
      float MFTLCORA(time, z) ;
            MFTLCORA:long_name = “RHO*W*TL anomaly in core averaged over the whole domain” ;
            MFTLCORA:units = “K kg/m2/s” ;
            MFTLCORA:missing_value = -9999.f ;
      float MFTLENV(time, z) ;
            MFTLENV:long_name = “RHO*W*TL in unsaturated environment averaged over the whole domain” ;
            MFTLENV:units = “K kg/m2/s” ;
            MFTLENV:missing_value = -9999.f ;
      float MFTLENVA(time, z) ;
            MFTLENVA:long_name = “RHO*W*TL anomaly in unsaturated environment averaged over the whole domain”
;
            MFTLENVA:units = “K kg/m2/s” ;
            MFTLENVA:missing_value = -9999.f ;
      float MFTLSDN(time, z) ;
            MFTLSDN:long_name = “RHO*W*TL in saturated downdrafts averaged over the whole domain” ;
            MFTLSDN:units = “K kg/m2/s” ;
            MFTLSDN:missing_value = -9999.f ;
      float MFTLSDNA(time, z) ;
            MFTLSDNA:long_name = “RHO*W*TL anomaly in saturated downdrafts averaged over the whole domain” ;
            MFTLSDNA:units = “K kg/m2/s” ;
            MFTLSDNA:missing_value = -9999.f ;
      float MFTLSUP(time, z) ;
            MFTLSUP:long_name = “RHO*W*TL in saturated updrafts averaged over the whole domain” ;
            MFTLSUP:units = “K kg/m2/s” ;
            MFTLSUP:missing_value = -9999.f ;
      float MFTLSUPA(time, z) ;
            MFTLSUPA:long_name = “RHO*W*TL anomaly in saturated updrafts averaged over the whole domain” ;
            MFTLSUPA:units = “K kg/m2/s” ;
            MFTLSUPA:missing_value = -9999.f ;
      float MFTVCDN(time, z) ;
            MFTVCDN:long_name = “RHO*W*TV in downdraft core averaged over the whole domain” ;
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                MFTVCDN:units = “K kg/m2/s” ;
                MFTVCDN:missing_value = -9999.f ;
        float MFTVCDNA(time, z) ;
                MFTVCDNA:long_name = “RHO*W*TV anomaly in downdraft core averaged over the whole domain” ;
                MFTVCDNA:units = “K kg/m2/s” ;
                MFTVCDNA:missing_value = -9999.f ;
        float MFTVCLD(time, z) ;
                MFTVCLD:long_name = “RHO*W*TV in cloud averaged over the whole domain” ;
                MFTVCLD:units = “K kg/m2/s” ;
                MFTVCLD:missing_value = -9999.f ;
        float MFTVCLDA(time, z) ;
                MFTVCLDA:long_name = “RHO*W*TV anomaly in cloud averaged over the whole domain” ;
                MFTVCLDA:units = “K kg/m2/s” ;
                MFTVCLDA:missing_value = -9999.f ;
        float MFTVCOR(time, z) ;
                MFTVCOR:long_name = “RHO*W*TV in core averaged over the whole domain” ;
                MFTVCOR:units = “K kg/m2/s” ;
                MFTVCOR:missing_value = -9999.f ;
        float MFTVCORA(time, z) ;
                MFTVCORA:long_name = “RHO*W*TV anomaly in core averaged over the whole domain” ;
                MFTVCORA:units = “K kg/m2/s” ;
                MFTVCORA:missing_value = -9999.f ;
        float MFTVENV(time, z) ;
                MFTVENV:long_name = “RHO*W*TV in unsaturated environment averaged over the whole domain” ;
                MFTVENV:units = “K kg/m2/s” ;
                MFTVENV:missing_value = -9999.f ;
        float MFTVENVA(time, z) ;
                MFTVENVA:long_name = “RHO*W*TV anomaly in unsaturated environment averaged over the whole do-
main” ;
                MFTVENVA:units = “K kg/m2/s” ;
                MFTVENVA:missing_value = -9999.f ;
        float MFTVSDN(time, z) ;
                MFTVSDN:long_name = “RHO*W*TV in saturated downdrafts averaged over the whole domain” ;
                MFTVSDN:units = “K kg/m2/s” ;
                MFTVSDN:missing_value = -9999.f ;
        float MFTVSDNA(time, z) ;
                MFTVSDNA:long_name = “RHO*W*TV anomaly in saturated downdrafts averaged over the whole domain” ;
                MFTVSDNA:units = “K kg/m2/s” ;
                MFTVSDNA:missing_value = -9999.f ;
        float MFTVSUP(time, z) ;
                MFTVSUP:long_name = “RHO*W*TV in saturated updrafts averaged over the whole domain” ;
                MFTVSUP:units = “K kg/m2/s” ;
                MFTVSUP:missing_value = -9999.f ;
        float MFTVSUPA(time, z) ;
                MFTVSUPA:long_name = “RHO*W*TV anomaly in saturated updrafts averaged over the whole domain” ;
                MFTVSUPA:units = “K kg/m2/s” ;
                MFTVSUPA:missing_value = -9999.f ;
        float MISRTOT(time) ;
                MISRTOT:long_name = “MISR Total Cloud Fraction” ;
                MISRTOT:units = “” ;
                MISRTOT:_FillValue = -1.f ;
        float MISRZTOP(time) ;
                MISRZTOP:long_name = “MISR Cloud-Top Height” ;
                MISRZTOP:units = “km” ;
                MISRZTOP:_FillValue = -1.f ;
        float MODISHGH(time) ;
                MODISHGH:long_name = “MODIS High Cloud Fraction (tau > 0.3)” ;
                MODISHGH:units = “” ;
                MODISHGH:_FillValue = -1.f ;
        float MODISIWP(time) ;
                MODISIWP:long_name = “MODIS Ice Water Path” ;
                MODISIWP:units = “g/m2” ;
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        MODISIWP:_FillValue = -1.f ;
float MODISLOW(time) ;
        MODISLOW:long_name = “MODIS Low Cloud Fraction” ;
        MODISLOW:units = “” ;
        MODISLOW:_FillValue = -1.f ;
float MODISLWP(time) ;
        MODISLWP:long_name = “MODIS Liquid Water Path” ;
        MODISLWP:units = “g/m2” ;
        MODISLWP:_FillValue = -1.f ;
float MODISMID(time) ;
        MODISMID:long_name = “MODIS Middle Cloud Fraction” ;
        MODISMID:units = “” ;
        MODISMID:_FillValue = -1.f ;
float MODISPTOP(time) ;
        MODISPTOP:long_name = “MODIS Cloud-Top Pressure” ;
        MODISPTOP:units = “mb” ;
        MODISPTOP:_FillValue = -1.f ;
float MODISREI(time) ;
        MODISREI:long_name = “MODIS Effective Radius (Ice)” ;
        MODISREI:units = “mkm” ;
        MODISREI:_FillValue = -1.f ;
float MODISREL(time) ;
        MODISREL:long_name = “MODIS Effective Radius (Liquid)” ;
        MODISREL:units = “mkm” ;
        MODISREL:_FillValue = -1.f ;
float MODISTAU(time) ;
        MODISTAU:long_name = “MODIS Cloud Optical Path” ;
        MODISTAU:units = “” ;
        MODISTAU:_FillValue = -1.f ;
float MODISTAUI(time) ;
        MODISTAUI:long_name = “MODIS Cloud Optical Path (Ice)” ;
        MODISTAUI:units = “” ;
        MODISTAUI:_FillValue = -1.f ;
float MODISTAUL(time) ;
        MODISTAUL:long_name = “MODIS Cloud Optical Path (Liquid)” ;
        MODISTAUL:units = “” ;
        MODISTAUL:_FillValue = -1.f ;
float MODISTOT(time) ;
        MODISTOT:long_name = “MODIS Total Cloud Fraction” ;
        MODISTOT:units = “” ;
        MODISTOT:_FillValue = -1.f ;
float MODISTOTI(time) ;
        MODISTOTI:long_name = “MODIS Total Fraction (Ice)” ;
        MODISTOTI:units = “” ;
        MODISTOTI:_FillValue = -1.f ;
float MODISTOTL(time) ;
        MODISTOTL:long_name = “MODIS Total Fraction (Liquid)” ;
        MODISTOTL:units = “” ;
        MODISTOTL:_FillValue = -1.f ;
float MSE(time, z) ;
        MSE:long_name = “Moist static energy” ;
        MSE:units = “K” ;
        MSE:missing_value = -9999.f ;
float MSECDN(time, z) ;
        MSECDN:long_name = “Mean moist static energy in downdraft core” ;
        MSECDN:units = “K” ;
        MSECDN:missing_value = -9999.f ;
float MSECLD(time, z) ;
        MSECLD:long_name = “Mean moist static energy in cloud” ;
        MSECLD:units = “K” ;
        MSECLD:missing_value = -9999.f ;
float MSECOR(time, z) ;
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                MSECOR:long_name = “Mean moist static energy in core” ;
                MSECOR:units = “K” ;
                MSECOR:missing_value = -9999.f ;
        float MSEENV(time, z) ;
                MSEENV:long_name = “Mean moist static energy in unsaturated environment” ;
                MSEENV:units = “K” ;
                MSEENV:missing_value = -9999.f ;
        float MSESDN(time, z) ;
                MSESDN:long_name = “Mean moist static energy in saturated downdrafts” ;
                MSESDN:units = “K” ;
                MSESDN:missing_value = -9999.f ;
        float MSESUP(time, z) ;
                MSESUP:long_name = “Mean moist static energy in saturated updrafts” ;
                MSESUP:units = “K” ;
                MSESUP:missing_value = -9999.f ;
        float NC(time, z) ;
                NC:long_name = “CLOUD WATER NUMBER CONCENTRATION” ;
                NC:units = “#/cm3” ;
                NC:missing_value = -9999.f ;
        float NCADV(time, z) ;
                NCADV:long_name = “Tendency of CLOUD WATER NUMBER CONCENTRATION due to resolved verti-
cal advection” ;
                NCADV:units = “#/cm3/day” ;
                NCADV:missing_value = -9999.f ;
        float NCCDN(time, z) ;
                NCCDN:long_name = “CLOUD WATER NUMBER CONCENTRATION in downdraft core” ;
                NCCDN:units = “#/cm3” ;
                NCCDN:missing_value = -9999.f ;
        float NCCLD(time, z) ;
                NCCLD:long_name = “CLOUD WATER NUMBER CONCENTRATION in cloud” ;
                NCCLD:units = “#/cm3” ;
                NCCLD:missing_value = -9999.f ;
        float NCCOR(time, z) ;
                NCCOR:long_name = “CLOUD WATER NUMBER CONCENTRATION in core” ;
                NCCOR:units = “#/cm3” ;
                NCCOR:missing_value = -9999.f ;
        float NCDIFF(time, z) ;
                NCDIFF:long_name = “Tendency of CLOUD WATER NUMBER CONCENTRATION due to vertical SGS
transport” ;
                NCDIFF:units = “#/cm3/day” ;
                NCDIFF:missing_value = -9999.f ;
        float NCENV(time, z) ;
                NCENV:long_name = “CLOUD WATER NUMBER CONCENTRATION in unsaturated environment” ;
                NCENV:units = “#/cm3” ;
                NCENV:missing_value = -9999.f ;
        float NCFLXR(time, z) ;
                NCFLXR:long_name = “Resolved flux of CLOUD WATER NUMBER CONCENTRATION” ;
                NCFLXR:units = “#/m2/s” ;
                NCFLXR:missing_value = -9999.f ;
        float NCFLXS(time, z) ;
                NCFLXS:long_name = “Subgrid flux of CLOUD WATER NUMBER CONCENTRATION” ;
                NCFLXS:units = “#/m2/s” ;
                NCFLXS:missing_value = -9999.f ;
        float NCLSADV(time, z) ;
                NCLSADV:long_name = “Tendency of CLOUD WATER NUMBER CONCENTRATION due to large-scale
vertical advecti” ;
                NCLSADV:units = “#/cm3/day” ;
                NCLSADV:missing_value = -9999.f ;
        float NCMN(time) ;
                NCMN:long_name = “GCSS Mean Drop Number Comcentration” ;
                NCMN:units = “#/cm3” ;
                NCMN:_FillValue = -1.f ;
```

```
        float NCMPHY(time, z) ;
                NCMPHY:long_name = "Tendency of CLOUD WATER NUMBER CONCENTRATION due to microphysi-
cal processes" ;
                NCMPHY:units = "#/cm3/day" ;
                NCMPHY:missing_value = -9999.f ;
        float NCSDFLX(time, z) ;
                NCSDFLX:long_name = "Sedimentation flux of CLOUD WATER NUMBER CONCENTRATION" ;
                NCSDFLX:units = "#/m2/s" ;
                NCSDFLX:missing_value = -9999.f ;
        float NCSDN(time, z) ;
                NCSDN:long_name = "CLOUD WATER NUMBER CONCENTRATION in saturated downdrafts" ;
                NCSDN:units = "#/cm3" ;
                NCSDN:missing_value = -9999.f ;
        float NCSED(time, z) ;
                NCSED:long_name = "Tendency of CLOUD WATER NUMBER CONCENTRATION due to sedimentation"
;
                NCSED:units = "#/cm3/day" ;
                NCSED:missing_value = -9999.f ;
        float NCSUP(time, z) ;
                NCSUP:long_name = "CLOUD WATER NUMBER CONCENTRATION in saturated updrafts" ;
                NCSUP:units = "#/cm3" ;
                NCSUP:missing_value = -9999.f ;
        float NG(time, z) ;
                NG:long_name = "GRAUPEL NUMBER CONCENTRATION" ;
                NG:units = "#/cm3" ;
                NG:missing_value = -9999.f ;
        float NGADV(time, z) ;
                NGADV:long_name = "Tendency of GRAUPEL NUMBER CONCENTRATION due to resolved vertical
advection" ;
                NGADV:units = "#/cm3/day" ;
                NGADV:missing_value = -9999.f ;
        float NGCDN(time, z) ;
                NGCDN:long_name = "GRAUPEL NUMBER CONCENTRATION in downdraft core" ;
                NGCDN:units = "#/cm3" ;
                NGCDN:missing_value = -9999.f ;
        float NGCLD(time, z) ;
                NGCLD:long_name = "GRAUPEL NUMBER CONCENTRATION in cloud" ;
                NGCLD:units = "#/cm3" ;
                NGCLD:missing_value = -9999.f ;
        float NGCOR(time, z) ;
                NGCOR:long_name = "GRAUPEL NUMBER CONCENTRATION in core" ;
                NGCOR:units = "#/cm3" ;
                NGCOR:missing_value = -9999.f ;
        float NGDIFF(time, z) ;
                NGDIFF:long_name = "Tendency of GRAUPEL NUMBER CONCENTRATION due to vertical SGS trans-
port" ;
                NGDIFF:units = "#/cm3/day" ;
                NGDIFF:missing_value = -9999.f ;
        float NGENV(time, z) ;
                NGENV:long_name = "GRAUPEL NUMBER CONCENTRATION in unsaturated environment" ;
                NGENV:units = "#/cm3" ;
                NGENV:missing_value = -9999.f ;
        float NGFLXR(time, z) ;
                NGFLXR:long_name = "Resolved flux of GRAUPEL NUMBER CONCENTRATION" ;
                NGFLXR:units = "#/m2/s" ;
                NGFLXR:missing_value = -9999.f ;
        float NGFLXS(time, z) ;
                NGFLXS:long_name = "Subgrid flux of GRAUPEL NUMBER CONCENTRATION" ;
                NGFLXS:units = "#/m2/s" ;
                NGFLXS:missing_value = -9999.f ;
        float NGLSADV(time, z) ;
                NGLSADV:long_name = "Tendency of GRAUPEL NUMBER CONCENTRATION due to large-scale vertical
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advection" ;
                NGLSADV:units = "#/cm3/day" ;
                NGLSADV:missing_value = -9999.f ;
        float NGMPHY(time, z) ;
                NGMPHY:long_name = "Tendency of GRAUPEL NUMBER CONCENTRATION due to microphysical
processes" ;
                NGMPHY:units = "#/cm3/day" ;
                NGMPHY:missing_value = -9999.f ;
        float NGSDFLX(time, z) ;
                NGSDFLX:long_name = "Sedimentation flux of GRAUPEL NUMBER CONCENTRATION" ;
                NGSDFLX:units = "#/m2/s" ;
                NGSDFLX:missing_value = -9999.f ;
        float NGSDN(time, z) ;
                NGSDN:long_name = "GRAUPEL NUMBER CONCENTRATION in saturated downdrafts" ;
                NGSDN:units = "#/cm3" ;
                NGSDN:missing_value = -9999.f ;
        float NGSED(time, z) ;
                NGSED:long_name = "Tendency of GRAUPEL NUMBER CONCENTRATION due to sedimentation" ;
                NGSED:units = "#/cm3/day" ;
                NGSED:missing_value = -9999.f ;
        float NGSUP(time, z) ;
                NGSUP:long_name = "GRAUPEL NUMBER CONCENTRATION in saturated updrafts" ;
                NGSUP:units = "#/cm3" ;
                NGSUP:missing_value = -9999.f ;
        float NI(time, z) ;
                NI:long_name = "CLOUD ICE NUMBER CONCENTRATION" ;
                NI:units = "#/cm3" ;
                NI:missing_value = -9999.f ;
        float NIADV(time, z) ;
                NIADV:long_name = "Tendency of CLOUD ICE NUMBER CONCENTRATION due to resolved vertical
advection" ;
                NIADV:units = "#/cm3/day" ;
                NIADV:missing_value = -9999.f ;
        float NICDN(time, z) ;
                NICDN:long_name = "CLOUD ICE NUMBER CONCENTRATION in downdraft core" ;
                NICDN:units = "#/cm3" ;
                NICDN:missing_value = -9999.f ;
        float NICLD(time, z) ;
                NICLD:long_name = "CLOUD ICE NUMBER CONCENTRATION in cloud" ;
                NICLD:units = "#/cm3" ;
                NICLD:missing_value = -9999.f ;
        float NICOR(time, z) ;
                NICOR:long_name = "CLOUD ICE NUMBER CONCENTRATION in core" ;
                NICOR:units = "#/cm3" ;
                NICOR:missing_value = -9999.f ;
        float NIDIFF(time, z) ;
                NIDIFF:long_name = "Tendency of CLOUD ICE NUMBER CONCENTRATION due to vertical SGS trans-
port" ;
                NIDIFF:units = "#/cm3/day" ;
                NIDIFF:missing_value = -9999.f ;
        float NIENV(time, z) ;
                NIENV:long_name = "CLOUD ICE NUMBER CONCENTRATION in unsaturated environment" ;
                NIENV:units = "#/cm3" ;
                NIENV:missing_value = -9999.f ;
        float NIFLXR(time, z) ;
                NIFLXR:long_name = "Resolved flux of CLOUD ICE NUMBER CONCENTRATION" ;
                NIFLXR:units = "#/m2/s" ;
                NIFLXR:missing_value = -9999.f ;
        float NIFLXS(time, z) ;
                NIFLXS:long_name = "Subgrid flux of CLOUD ICE NUMBER CONCENTRATION" ;
                NIFLXS:units = "#/m2/s" ;
                NIFLXS:missing_value = -9999.f ;
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```
        float NILSADV(time, z) ;
                NILSADV:long_name = “Tendency of CLOUD ICE NUMBER CONCENTRATION due to large-scale verti-
cal advection” ;
                NILSADV:units = “#/cm3/day” ;
                NILSADV:missing_value = -9999.f ;
        float NIMPHY(time, z) ;
                NIMPHY:long_name = “Tendency of CLOUD ICE NUMBER CONCENTRATION due to microphysical
processes” ;
                NIMPHY:units = “#/cm3/day” ;
                NIMPHY:missing_value = -9999.f ;
        float NISDFLX(time, z) ;
                NISDFLX:long_name = “Sedimentation flux of CLOUD ICE NUMBER CONCENTRATION” ;
                NISDFLX:units = “#/m2/s” ;
                NISDFLX:missing_value = -9999.f ;
        float NISDN(time, z) ;
                NISDN:long_name = “CLOUD ICE NUMBER CONCENTRATION in saturated downdrafts” ;
                NISDN:units = “#/cm3” ;
                NISDN:missing_value = -9999.f ;
        float NISED(time, z) ;
                NISED:long_name = “Tendency of CLOUD ICE NUMBER CONCENTRATION due to sedimentation” ;
                NISED:units = “#/cm3/day” ;
                NISED:missing_value = -9999.f ;
        float NISUP(time, z) ;
                NISUP:long_name = “CLOUD ICE NUMBER CONCENTRATION in saturated updrafts” ;
                NISUP:units = “#/cm3” ;
                NISUP:missing_value = -9999.f ;
        float NR(time, z) ;
                NR:long_name = “RAIN NUMBER CONCENTRATION” ;
                NR:units = “#/cm3” ;
                NR:missing_value = -9999.f ;
        float NRADV(time, z) ;
                NRADV:long_name = “Tendency of RAIN NUMBER CONCENTRATION due to resolved vertical advection”
;
                NRADV:units = “#/cm3/day” ;
                NRADV:missing_value = -9999.f ;
        float NRCDN(time, z) ;
                NRCDN:long_name = “RAIN NUMBER CONCENTRATION in downdraft core” ;
                NRCDN:units = “#/cm3” ;
                NRCDN:missing_value = -9999.f ;
        float NRCLD(time, z) ;
                NRCLD:long_name = “RAIN NUMBER CONCENTRATION in cloud” ;
                NRCLD:units = “#/cm3” ;
                NRCLD:missing_value = -9999.f ;
        float NRCOR(time, z) ;
                NRCOR:long_name = “RAIN NUMBER CONCENTRATION in core” ;
                NRCOR:units = “#/cm3” ;
                NRCOR:missing_value = -9999.f ;
        float NRDIFF(time, z) ;
                NRDIFF:long_name = “Tendency of RAIN NUMBER CONCENTRATION due to vertical SGS transport” ;
                NRDIFF:units = “#/cm3/day” ;
                NRDIFF:missing_value = -9999.f ;
        float NRENV(time, z) ;
                NRENV:long_name = “RAIN NUMBER CONCENTRATION in unsaturated environment” ;
                NRENV:units = “#/cm3” ;
                NRENV:missing_value = -9999.f ;
        float NRFLXR(time, z) ;
                NRFLXR:long_name = “Resolved flux of RAIN NUMBER CONCENTRATION” ;
                NRFLXR:units = “#/m2/s” ;
                NRFLXR:missing_value = -9999.f ;
        float NRFLXS(time, z) ;
                NRFLXS:long_name = “Subgrid flux of RAIN NUMBER CONCENTRATION” ;
                NRFLXS:units = “#/m2/s” ;
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                NRFLXS:missing_value = -9999.f ;
        float NRLSADV(time, z) ;
                NRLSADV:long_name = "Tendency of RAIN NUMBER CONCENTRATION due to large-scale vertical
advection" ;
                NRLSADV:units = "#/cm3/day" ;
                NRLSADV:missing_value = -9999.f ;
        float NRMN(time) ;
                NRMN:long_name = "GCSS Mean Rain Number Comcentration" ;
                NRMN:units = "#/cm3" ;
                NRMN:_FillValue = -1.f ;
        float NRMPHY(time, z) ;
                NRMPHY:long_name = "Tendency of RAIN NUMBER CONCENTRATION due to microphysical processes"
;
                NRMPHY:units = "#/cm3/day" ;
                NRMPHY:missing_value = -9999.f ;
        float NRSDFLX(time, z) ;
                NRSDFLX:long_name = "Sedimentation flux of RAIN NUMBER CONCENTRATION" ;
                NRSDFLX:units = "#/m2/s" ;
                NRSDFLX:missing_value = -9999.f ;
        float NRSDN(time, z) ;
                NRSDN:long_name = "RAIN NUMBER CONCENTRATION in saturated downdrafts" ;
                NRSDN:units = "#/cm3" ;
                NRSDN:missing_value = -9999.f ;
        float NRSED(time, z) ;
                NRSED:long_name = "Tendency of RAIN NUMBER CONCENTRATION due to sedimentation" ;
                NRSED:units = "#/cm3/day" ;
                NRSED:missing_value = -9999.f ;
        float NRSUP(time, z) ;
                NRSUP:long_name = "RAIN NUMBER CONCENTRATION in saturated updrafts" ;
                NRSUP:units = "#/cm3" ;
                NRSUP:missing_value = -9999.f ;
        float NS(time, z) ;
                NS:long_name = "SNOW NUMBER CONCENTRATION" ;
                NS:units = "#/cm3" ;
                NS:missing_value = -9999.f ;
        float NSADV(time, z) ;
                NSADV:long_name = "Tendency of SNOW NUMBER CONCENTRATION due to resolved vertical advec-
tion" ;
                NSADV:units = "#/cm3/day" ;
                NSADV:missing_value = -9999.f ;
        float NSCDN(time, z) ;
                NSCDN:long_name = "SNOW NUMBER CONCENTRATION in downdraft core" ;
                NSCDN:units = "#/cm3" ;
                NSCDN:missing_value = -9999.f ;
        float NSCLD(time, z) ;
                NSCLD:long_name = "SNOW NUMBER CONCENTRATION in cloud" ;
                NSCLD:units = "#/cm3" ;
                NSCLD:missing_value = -9999.f ;
        float NSCOR(time, z) ;
                NSCOR:long_name = "SNOW NUMBER CONCENTRATION in core" ;
                NSCOR:units = "#/cm3" ;
                NSCOR:missing_value = -9999.f ;
        float NSDIFF(time, z) ;
                NSDIFF:long_name = "Tendency of SNOW NUMBER CONCENTRATION due to vertical SGS transport" ;
                NSDIFF:units = "#/cm3/day" ;
                NSDIFF:missing_value = -9999.f ;
        float NSENV(time, z) ;
                NSENV:long_name = "SNOW NUMBER CONCENTRATION in unsaturated environment" ;
                NSENV:units = "#/cm3" ;
                NSENV:missing_value = -9999.f ;
        float NSFLXR(time, z) ;
                NSFLXR:long_name = "Resolved flux of SNOW NUMBER CONCENTRATION" ;
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                NSFLXR:units = "#/m2/s" ;
                NSFLXR:missing_value = -9999.f ;
        float NSFLXS(time, z) ;
                NSFLXS:long_name = "Subgrid flux of SNOW NUMBER CONCENTRATION" ;
                NSFLXS:units = "#/m2/s" ;
                NSFLXS:missing_value = -9999.f ;
        float NSLSADV(time, z) ;
                NSLSADV:long_name = "Tendency of SNOW NUMBER CONCENTRATION due to large-scale vertical
advection" ;
                NSLSADV:units = "#/cm3/day" ;
                NSLSADV:missing_value = -9999.f ;
        float NSMPHY(time, z) ;
                NSMPHY:long_name = "Tendency of SNOW NUMBER CONCENTRATION due to microphysical processes"
;
                NSMPHY:units = "#/cm3/day" ;
                NSMPHY:missing_value = -9999.f ;
        float NSSDFLX(time, z) ;
                NSSDFLX:long_name = "Sedimentation flux of SNOW NUMBER CONCENTRATION" ;
                NSSDFLX:units = "#/m2/s" ;
                NSSDFLX:missing_value = -9999.f ;
        float NSSDN(time, z) ;
                NSSDN:long_name = "SNOW NUMBER CONCENTRATION in saturated downdrafts" ;
                NSSDN:units = "#/cm3" ;
                NSSDN:missing_value = -9999.f ;
        float NSSED(time, z) ;
                NSSED:long_name = "Tendency of SNOW NUMBER CONCENTRATION due to sedimentation" ;
                NSSED:units = "#/cm3/day" ;
                NSSED:missing_value = -9999.f ;
        float NSSUP(time, z) ;
                NSSUP:long_name = "SNOW NUMBER CONCENTRATION in saturated updrafts" ;
                NSSUP:units = "#/cm3" ;
                NSSUP:missing_value = -9999.f ;
        float PREC(time) ;
                PREC:long_name = "Surface Precipitation" ;
                PREC:units = "mm/day" ;
        float PREC2(time) ;
                PREC2:long_name = "GCSS Variance of Precipitation Rate" ;
                PREC2:units = "(mm/d)^2" ;
                PREC2:_FillValue = -1.f ;
        float PRECIP(time, z) ;
                PRECIP:long_name = "Precipitation flux" ;
                PRECIP:units = "mm/day" ;
                PRECIP:missing_value = -9999.f ;
        float PRECMAX(time) ;
                PRECMAX:long_name = "GCSS Maximum Precipitation Rate" ;
                PRECMAX:units = "mm/d" ;
                PRECMAX:_FillValue = -1.f ;
        float PRECMN(time) ;
                PRECMN:long_name = "GCSS Precipitation Rate" ;
                PRECMN:units = "mm/d" ;
                PRECMN:_FillValue = -1.f ;
        float PRES(time, z) ;
                PRES:long_name = "Pressure" ;
                PRES:units = "mb" ;
                PRES:missing_value = -9999.f ;
        float PRESSTR(time, z) ;
                PRESSTR:long_name = "Pressure transport of TKE (Resolved)" ;
                PRESSTR:units = "m2/s3" ;
                PRESSTR:missing_value = -9999.f ;
        float PW(time) ;
                PW:long_name = "Precipitable Water" ;
                PW:units = "mm" ;
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float PWOBS(time) ;
        PWOBS:long_name = "Observed Precipitable Water" ;
        PWOBS:units = "mm" ;
float Ps(time) ;
        Ps:long_name = "Surface Pressure" ;
        Ps:units = "" ;
float Q1C(time, z) ;
        Q1C:long_name = "Apparent heat source: Q1 - QR" ;
        Q1C:units = "K/day" ;
        Q1C:missing_value = -9999.f ;
float Q2(time, z) ;
        Q2:long_name = "Apparent moisture sink: Q2" ;
        Q2:units = "K/day" ;
        Q2:missing_value = -9999.f ;
float Q2ADVTR(time, z) ;
        Q2ADVTR:long_name = "Transport of total water variance" ;
        Q2ADVTR:units = "1/s" ;
        Q2ADVTR:missing_value = -9999.f ;
float Q2DIFTR(time, z) ;
        Q2DIFTR:long_name = "SGS transport of total water variance" ;
        Q2DIFTR:units = "1/s" ;
        Q2DIFTR:missing_value = -9999.f ;
float Q2DISSIP(time, z) ;
        Q2DISSIP:long_name = "Dissipation of total water variance" ;
        Q2DISSIP:units = "1/s" ;
        Q2DISSIP:missing_value = -9999.f ;
float Q2GRAD(time, z) ;
        Q2GRAD:long_name = "Gradient production of total water variance" ;
        Q2GRAD:units = "1/s" ;
        Q2GRAD:missing_value = -9999.f ;
float Q2PREC(time, z) ;
        Q2PREC:long_name = "Precipitation production of total water variance" ;
        Q2PREC:units = "1/s" ;
        Q2PREC:missing_value = -9999.f ;
float QC(time, z) ;
        QC:long_name = "Cloud liquid water mass mixing ratio" ;
        QC:units = "g/kg" ;
        QC:missing_value = -9999.f ;
float QC2(time, z) ;
        QC2:long_name = "Variance of cloud water" ;
        QC2:units = "g2/kg2" ;
        QC2:missing_value = -9999.f ;
float QCCDN(time, z) ;
        QCCDN:long_name = "Cloud liquid water mixing ratio in downdraft core" ;
        QCCDN:units = "kg/kg" ;
        QCCDN:missing_value = -9999.f ;
float QCCLD(time, z) ;
        QCCLD:long_name = "Cloud liquid water mixing ratio in cloud" ;
        QCCLD:units = "kg/kg" ;
        QCCLD:missing_value = -9999.f ;
float QCCOR(time, z) ;
        QCCOR:long_name = "Cloud liquid water mixing ratio in core" ;
        QCCOR:units = "kg/kg" ;
        QCCOR:missing_value = -9999.f ;
float QCENV(time, z) ;
        QCENV:long_name = "Cloud liquid water mixing ratio in unsaturated environment" ;
        QCENV:units = "kg/kg" ;
        QCENV:missing_value = -9999.f ;
float QCFLUX(time, z) ;
        QCFLUX:long_name = "Liquid water flux (Resolved)" ;
        QCFLUX:units = "W/m2" ;
        QCFLUX:missing_value = -9999.f ;
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float QCI(time, z) ;
        QCI:long_name = “Cloud ice” ;
        QCI:units = “g/kg” ;
        QCI:missing_value = -9999.f ;
float QCL(time, z) ;
        QCL:long_name = “Cloud water” ;
        QCL:units = “g/kg” ;
        QCL:missing_value = -9999.f ;
float QCOEFFR(time, z) ;
        QCOEFFR:long_name = “Mixing ratio of QC over effective radius, EFFR = QC/QCOEFFR” ;
        QCOEFFR:units = “g/kg/micro” ;
        QCOEFFR:missing_value = -9999.f ;
float QCOND(time, z) ;
        QCOND:long_name = “Total Condensate” ;
        QCOND:units = “g/kg” ;
        QCOND:missing_value = -9999.f ;
float QCSDN(time, z) ;
        QCSDN:long_name = “Cloud liquid water mixing ratio in saturated downdrafts” ;
        QCSDN:units = “kg/kg” ;
        QCSDN:missing_value = -9999.f ;
float QCSUP(time, z) ;
        QCSUP:long_name = “Cloud liquid water mixing ratio in saturated updrafts” ;
        QCSUP:units = “kg/kg” ;
        QCSUP:missing_value = -9999.f ;
float QCWCDN(time, z) ;
        QCWCDN:long_name = “QCW in downdraft core averaged over the whole domain” ;
        QCWCDN:units = “g/kg m/s” ;
        QCWCDN:missing_value = -9999.f ;
float QCWCLD(time, z) ;
        QCWCLD:long_name = “QCW in cloud averaged over the whole domain” ;
        QCWCLD:units = “g/kg m/s” ;
        QCWCLD:missing_value = -9999.f ;
float QCWCOR(time, z) ;
        QCWCOR:long_name = “QCW in core averaged over the whole domain” ;
        QCWCOR:units = “g/kg m/s” ;
        QCWCOR:missing_value = -9999.f ;
float QCWENV(time, z) ;
        QCWENV:long_name = “QCW in unsaturated environment averaged over the whole domain” ;
        QCWENV:units = “g/kg m/s” ;
        QCWENV:missing_value = -9999.f ;
float QCWSDN(time, z) ;
        QCWSDN:long_name = “QCW in saturated downdrafts averaged over the whole domain” ;
        QCWSDN:units = “g/kg m/s” ;
        QCWSDN:missing_value = -9999.f ;
float QCWSUP(time, z) ;
        QCWSUP:long_name = “QCW in saturated updrafts averaged over the whole domain” ;
        QCWSUP:units = “g/kg m/s” ;
        QCWSUP:missing_value = -9999.f ;
float QG(time, z) ;
        QG:long_name = “GRAUPEL” ;
        QG:units = “g/kg” ;
        QG:missing_value = -9999.f ;
float QGADV(time, z) ;
        QGADV:long_name = “Tendency of GRAUPEL due to resolved vertical advection” ;
        QGADV:units = “g/kg/day” ;
        QGADV:missing_value = -9999.f ;
float QGCDN(time, z) ;
        QGCDN:long_name = “GRAUPEL in downdraft core” ;
        QGCDN:units = “g/kg” ;
        QGCDN:missing_value = -9999.f ;
float QGCLD(time, z) ;
        QGCLD:long_name = “GRAUPEL in cloud” ;
```

```
        QGCLD:units = “g/kg” ;
        QGCLD:missing_value = -9999.f ;
float QGCOR(time, z) ;
        QGCOR:long_name = “GRAUPEL in core” ;
        QGCOR:units = “g/kg” ;
        QGCOR:missing_value = -9999.f ;
float QGDIFF(time, z) ;
        QGDIFF:long_name = “Tendency of GRAUPEL due to vertical SGS transport” ;
        QGDIFF:units = “g/kg/day” ;
        QGDIFF:missing_value = -9999.f ;
float QGENV(time, z) ;
        QGENV:long_name = “GRAUPEL in unsaturated environment” ;
        QGENV:units = “g/kg” ;
        QGENV:missing_value = -9999.f ;
float QGFLXR(time, z) ;
        QGFLXR:long_name = “Resolved flux of GRAUPEL” ;
        QGFLXR:units = “W/m2” ;
        QGFLXR:missing_value = -9999.f ;
float QGFLXS(time, z) ;
        QGFLXS:long_name = “Subgrid flux of GRAUPEL” ;
        QGFLXS:units = “W/m2” ;
        QGFLXS:missing_value = -9999.f ;
float QGFRAC(time, z) ;
        QGFRAC:long_name = “GRAUPEL FRACTION” ;
        QGFRAC:units = “1” ;
        QGFRAC:missing_value = -9999.f ;
float QGLSADV(time, z) ;
        QGLSADV:long_name = “Tendency of GRAUPEL due to large-scale vertical advection” ;
        QGLSADV:units = “g/kg/day” ;
        QGLSADV:missing_value = -9999.f ;
float QGMPHY(time, z) ;
        QGMPHY:long_name = “Tendency of GRAUPEL due to microphysical processes” ;
        QGMPHY:units = “g/kg/day” ;
        QGMPHY:missing_value = -9999.f ;
float QGOEFFR(time, z) ;
        QGOEFFR:long_name = “Mixing ratio of GRAUPEL over effective radius, EFFR = QG/QGOEFFR” ;
        QGOEFFR:units = “g/kg/micro” ;
        QGOEFFR:missing_value = -9999.f ;
float QGSDFLX(time, z) ;
        QGSDFLX:long_name = “Sedimentation flux of GRAUPEL” ;
        QGSDFLX:units = “W/m2” ;
        QGSDFLX:missing_value = -9999.f ;
float QGSDN(time, z) ;
        QGSDN:long_name = “GRAUPEL in saturated downdrafts” ;
        QGSDN:units = “g/kg” ;
        QGSDN:missing_value = -9999.f ;
float QGSED(time, z) ;
        QGSED:long_name = “Tendency of GRAUPEL due to sedimentation” ;
        QGSED:units = “g/kg/day” ;
        QGSED:missing_value = -9999.f ;
float QGSUP(time, z) ;
        QGSUP:long_name = “GRAUPEL in saturated updrafts” ;
        QGSUP:units = “g/kg” ;
        QGSUP:missing_value = -9999.f ;
float QHTEND(time, z) ;
        QHTEND:long_name = “Large-Scale Horizontal Advection Moisture Tendency” ;
        QHTEND:units = “g/kg/day” ;
        QHTEND:missing_value = -9999.f ;
float QI(time, z) ;
        QI:long_name = “CLOUD ICE” ;
        QI:units = “g/kg” ;
        QI:missing_value = -9999.f ;
```

```
float QI2(time, z) ;
        QI2:long_name = “Variance of cloud ice” ;
        QI2:units = “g2/kg2” ;
        QI2:missing_value = -9999.f ;
float QIADV(time, z) ;
        QIADV:long_name = “Tendency of CLOUD ICE due to resolved vertical advection” ;
        QIADV:units = “g/kg/day” ;
        QIADV:missing_value = -9999.f ;
float QICDN(time, z) ;
        QICDN:long_name = “CLOUD ICE in downdraft core” ;
        QICDN:units = “g/kg” ;
        QICDN:missing_value = -9999.f ;
float QICLD(time, z) ;
        QICLD:long_name = “CLOUD ICE in cloud” ;
        QICLD:units = “g/kg” ;
        QICLD:missing_value = -9999.f ;
float QICOR(time, z) ;
        QICOR:long_name = “CLOUD ICE in core” ;
        QICOR:units = “g/kg” ;
        QICOR:missing_value = -9999.f ;
float QIDIFF(time, z) ;
        QIDIFF:long_name = “Tendency of CLOUD ICE due to vertical SGS transport” ;
        QIDIFF:units = “g/kg/day” ;
        QIDIFF:missing_value = -9999.f ;
float QIENV(time, z) ;
        QIENV:long_name = “CLOUD ICE in unsaturated environment” ;
        QIENV:units = “g/kg” ;
        QIENV:missing_value = -9999.f ;
float QIFLUX(time, z) ;
        QIFLUX:long_name = “Ice flux (Resolved)” ;
        QIFLUX:units = “W/m2” ;
        QIFLUX:missing_value = -9999.f ;
float QIFLXR(time, z) ;
        QIFLXR:long_name = “Resolved flux of CLOUD ICE” ;
        QIFLXR:units = “W/m2” ;
        QIFLXR:missing_value = -9999.f ;
float QIFLXS(time, z) ;
        QIFLXS:long_name = “Subgrid flux of CLOUD ICE” ;
        QIFLXS:units = “W/m2” ;
        QIFLXS:missing_value = -9999.f ;
float QIFRAC(time, z) ;
        QIFRAC:long_name = “CLOUD ICE FRACTION” ;
        QIFRAC:units = “1” ;
        QIFRAC:missing_value = -9999.f ;
float QILSADV(time, z) ;
        QILSADV:long_name = “Tendency of CLOUD ICE due to large-scale vertical advection” ;
        QILSADV:units = “g/kg/day” ;
        QILSADV:missing_value = -9999.f ;
float QIMPHY(time, z) ;
        QIMPHY:long_name = “Tendency of CLOUD ICE due to microphysical processes” ;
        QIMPHY:units = “g/kg/day” ;
        QIMPHY:missing_value = -9999.f ;
float QIOEFFR(time, z) ;
        QIOEFFR:long_name = “Mixing ratio of CLOUD ICE over effective radius, EFFR = QI/QIOEFFR” ;
        QIOEFFR:units = “g/kg/micro” ;
        QIOEFFR:missing_value = -9999.f ;
float QISDFLX(time, z) ;
        QISDFLX:long_name = “Sedimentation flux of CLOUD ICE” ;
        QISDFLX:units = “W/m2” ;
        QISDFLX:missing_value = -9999.f ;
float QISDN(time, z) ;
        QISDN:long_name = “CLOUD ICE in saturated downdrafts” ;
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        QISDN:units = “g/kg” ;
        QISDN:missing_value = -9999.f ;
float QISED(time, z) ;
        QISED:long_name = “Tendency of CLOUD ICE due to sedimentation” ;
        QISED:units = “g/kg/day” ;
        QISED:missing_value = -9999.f ;
float QISUP(time, z) ;
        QISUP:long_name = “CLOUD ICE in saturated updrafts” ;
        QISUP:units = “g/kg” ;
        QISUP:missing_value = -9999.f ;
float QIWCDN(time, z) ;
        QIWCDN:long_name = “QIW in downdraft core averaged over the whole domain” ;
        QIWCDN:units = “g/kg m/s” ;
        QIWCDN:missing_value = -9999.f ;
float QIWCLD(time, z) ;
        QIWCLD:long_name = “QIW in cloud averaged over the whole domain” ;
        QIWCLD:units = “g/kg m/s” ;
        QIWCLD:missing_value = -9999.f ;
float QIWCOR(time, z) ;
        QIWCOR:long_name = “QIW in core averaged over the whole domain” ;
        QIWCOR:units = “g/kg m/s” ;
        QIWCOR:missing_value = -9999.f ;
float QIWENV(time, z) ;
        QIWENV:long_name = “QIW in unsaturated environment averaged over the whole domain” ;
        QIWENV:units = “g/kg m/s” ;
        QIWENV:missing_value = -9999.f ;
float QIWSDN(time, z) ;
        QIWSDN:long_name = “QIW in saturated downdrafts averaged over the whole domain” ;
        QIWSDN:units = “g/kg m/s” ;
        QIWSDN:missing_value = -9999.f ;
float QIWSUP(time, z) ;
        QIWSUP:long_name = “QIW in saturated updrafts averaged over the whole domain” ;
        QIWSUP:units = “g/kg m/s” ;
        QIWSUP:missing_value = -9999.f ;
float QN(time, z) ;
        QN:long_name = “Cloud water and cloud ice” ;
        QN:units = “g/kg” ;
        QN:missing_value = -9999.f ;
float QNCDN(time, z) ;
        QNCDN:long_name = “Mean QN in downdraft core” ;
        QNCDN:units = “g/kg” ;
        QNCDN:missing_value = -9999.f ;
float QNCLD(time, z) ;
        QNCLD:long_name = “Mean QN in cloud” ;
        QNCLD:units = “g/kg” ;
        QNCLD:missing_value = -9999.f ;
float QNCOR(time, z) ;
        QNCOR:long_name = “Mean QN in core” ;
        QNCOR:units = “g/kg” ;
        QNCOR:missing_value = -9999.f ;
float QNENV(time, z) ;
        QNENV:long_name = “Mean QN in unsaturated environment” ;
        QNENV:units = “g/kg” ;
        QNENV:missing_value = -9999.f ;
float QNSDN(time, z) ;
        QNSDN:long_name = “Mean QN in saturated downdrafts” ;
        QNSDN:units = “g/kg” ;
        QNSDN:missing_value = -9999.f ;
float QNSUP(time, z) ;
        QNSUP:long_name = “Mean QN in saturated updrafts” ;
        QNSUP:units = “g/kg” ;
        QNSUP:missing_value = -9999.f ;
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```
float QNUDGE(time, z) ;
        QNUDGE:long_name = “Large-Scale Moisture Nudging” ;
        QNUDGE:units = “g/kg/day” ;
        QNUDGE:missing_value = -9999.f ;
float QP(time, z) ;
        QP:long_name = “Rain and Snow” ;
        QP:units = “g/kg” ;
        QP:missing_value = -9999.f ;
float QPCDN(time, z) ;
        QPCDN:long_name = “Mean QP in downdraft core” ;
        QPCDN:units = “g/kg” ;
        QPCDN:missing_value = -9999.f ;
float QPCLD(time, z) ;
        QPCLD:long_name = “Mean QP in cloud” ;
        QPCLD:units = “g/kg” ;
        QPCLD:missing_value = -9999.f ;
float QPCOR(time, z) ;
        QPCOR:long_name = “Mean QP in core” ;
        QPCOR:units = “g/kg” ;
        QPCOR:missing_value = -9999.f ;
float QPENV(time, z) ;
        QPENV:long_name = “Mean QP in unsaturated environment” ;
        QPENV:units = “g/kg” ;
        QPENV:missing_value = -9999.f ;
float QPI(time, z) ;
        QPI:long_name = “Snow content” ;
        QPI:units = “g/kg” ;
        QPI:missing_value = -9999.f ;
float QPL(time, z) ;
        QPL:long_name = “Rain content” ;
        QPL:units = “g/kg” ;
        QPL:missing_value = -9999.f ;
float QPSDN(time, z) ;
        QPSDN:long_name = “Mean QP in saturated downdrafts” ;
        QPSDN:units = “g/kg” ;
        QPSDN:missing_value = -9999.f ;
float QPSUP(time, z) ;
        QPSUP:long_name = “Mean QP in saturated updrafts” ;
        QPSUP:units = “g/kg” ;
        QPSUP:missing_value = -9999.f ;
float QR(time, z) ;
        QR:long_name = “RAIN” ;
        QR:units = “g/kg” ;
        QR:missing_value = -9999.f ;
float QRADV(time, z) ;
        QRADV:long_name = “Tendency of RAIN due to resolved vertical advection” ;
        QRADV:units = “g/kg/day” ;
        QRADV:missing_value = -9999.f ;
float QRCDN(time, z) ;
        QRCDN:long_name = “RAIN in downdraft core” ;
        QRCDN:units = “g/kg” ;
        QRCDN:missing_value = -9999.f ;
float QRCLD(time, z) ;
        QRCLD:long_name = “RAIN in cloud” ;
        QRCLD:units = “g/kg” ;
        QRCLD:missing_value = -9999.f ;
float QRCOR(time, z) ;
        QRCOR:long_name = “RAIN in core” ;
        QRCOR:units = “g/kg” ;
        QRCOR:missing_value = -9999.f ;
float QRDIFF(time, z) ;
        QRDIFF:long_name = “Tendency of RAIN due to vertical SGS transport” ;
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        QRDIFF:units = “g/kg/day” ;
        QRDIFF:missing_value = -9999.f ;
float QRENV(time, z) ;
        QRENV:long_name = “RAIN in unsaturated environment” ;
        QRENV:units = “g/kg” ;
        QRENV:missing_value = -9999.f ;
float QRFLXR(time, z) ;
        QRFLXR:long_name = “Resolved flux of RAIN” ;
        QRFLXR:units = “W/m2” ;
        QRFLXR:missing_value = -9999.f ;
float QRFLXS(time, z) ;
        QRFLXS:long_name = “Subgrid flux of RAIN” ;
        QRFLXS:units = “W/m2” ;
        QRFLXS:missing_value = -9999.f ;
float QRFRAC(time, z) ;
        QRFRAC:long_name = “RAIN FRACTION” ;
        QRFRAC:units = “1” ;
        QRFRAC:missing_value = -9999.f ;
float QRLSADV(time, z) ;
        QRLSADV:long_name = “Tendency of RAIN due to large-scale vertical advection” ;
        QRLSADV:units = “g/kg/day” ;
        QRLSADV:missing_value = -9999.f ;
float QRMPHY(time, z) ;
        QRMPHY:long_name = “Tendency of RAIN due to microphysical processes” ;
        QRMPHY:units = “g/kg/day” ;
        QRMPHY:missing_value = -9999.f ;
float QROEFFR(time, z) ;
        QROEFFR:long_name = “Mixing ratio of RAIN over effective radius, EFFR = QR/QROEFFR” ;
        QROEFFR:units = “g/kg/micro” ;
        QROEFFR:missing_value = -9999.f ;
float QRSDFLX(time, z) ;
        QRSDFLX:long_name = “Sedimentation flux of RAIN” ;
        QRSDFLX:units = “W/m2” ;
        QRSDFLX:missing_value = -9999.f ;
float QRSDN(time, z) ;
        QRSDN:long_name = “RAIN in saturated downdrafts” ;
        QRSDN:units = “g/kg” ;
        QRSDN:missing_value = -9999.f ;
float QRSED(time, z) ;
        QRSED:long_name = “Tendency of RAIN due to sedimentation” ;
        QRSED:units = “g/kg/day” ;
        QRSED:missing_value = -9999.f ;
float QRSUP(time, z) ;
        QRSUP:long_name = “RAIN in saturated updrafts” ;
        QRSUP:units = “g/kg” ;
        QRSUP:missing_value = -9999.f ;
float QS(time, z) ;
        QS:long_name = “SNOW” ;
        QS:units = “g/kg” ;
        QS:missing_value = -9999.f ;
float QS2(time, z) ;
        QS2:long_name = “Variance of saturation mixing ratio” ;
        QS2:units = “g2/kg2” ;
        QS2:missing_value = -9999.f ;
float QSADV(time, z) ;
        QSADV:long_name = “Tendency of SNOW due to resolved vertical advection” ;
        QSADV:units = “g/kg/day” ;
        QSADV:missing_value = -9999.f ;
float QSAT(time, z) ;
        QSAT:long_name = “Saturation mixing ratio” ;
        QSAT:units = “g/kg” ;
        QSAT:missing_value = -9999.f ;
```

```
float QSCDN(time, z) ;
        QSCDN:long_name = “SNOW in downdraft core” ;
        QSCDN:units = “g/kg” ;
        QSCDN:missing_value = -9999.f ;
float QSCLD(time, z) ;
        QSCLD:long_name = “SNOW in cloud” ;
        QSCLD:units = “g/kg” ;
        QSCLD:missing_value = -9999.f ;
float QSCOR(time, z) ;
        QSCOR:long_name = “SNOW in core” ;
        QSCOR:units = “g/kg” ;
        QSCOR:missing_value = -9999.f ;
float QSDIFF(time, z) ;
        QSDIFF:long_name = “Tendency of SNOW due to vertical SGS transport” ;
        QSDIFF:units = “g/kg/day” ;
        QSDIFF:missing_value = -9999.f ;
float QSENV(time, z) ;
        QSENV:long_name = “SNOW in unsaturated environment” ;
        QSENV:units = “g/kg” ;
        QSENV:missing_value = -9999.f ;
float QSFLXR(time, z) ;
        QSFLXR:long_name = “Resolved flux of SNOW” ;
        QSFLXR:units = “W/m2” ;
        QSFLXR:missing_value = -9999.f ;
float QSFLXS(time, z) ;
        QSFLXS:long_name = “Subgrid flux of SNOW” ;
        QSFLXS:units = “W/m2” ;
        QSFLXS:missing_value = -9999.f ;
float QSFRAC(time, z) ;
        QSFRAC:long_name = “SNOW FRACTION” ;
        QSFRAC:units = “1” ;
        QSFRAC:missing_value = -9999.f ;
float QSLSADV(time, z) ;
        QSLSADV:long_name = “Tendency of SNOW due to large-scale vertical advection” ;
        QSLSADV:units = “g/kg/day” ;
        QSLSADV:missing_value = -9999.f ;
float QSMPHY(time, z) ;
        QSMPHY:long_name = “Tendency of SNOW due to microphysical processes” ;
        QSMPHY:units = “g/kg/day” ;
        QSMPHY:missing_value = -9999.f ;
float QSOEFFR(time, z) ;
        QSOEFFR:long_name = “Mixing ratio of SNOW over effective radius, EFFR = QS/QSOEFFR” ;
        QSOEFFR:units = “g/kg/micro” ;
        QSOEFFR:missing_value = -9999.f ;
float QSSDFLX(time, z) ;
        QSSDFLX:long_name = “Sedimentation flux of SNOW” ;
        QSSDFLX:units = “W/m2” ;
        QSSDFLX:missing_value = -9999.f ;
float QSSDN(time, z) ;
        QSSDN:long_name = “SNOW in saturated downdrafts” ;
        QSSDN:units = “g/kg” ;
        QSSDN:missing_value = -9999.f ;
float QSSED(time, z) ;
        QSSED:long_name = “Tendency of SNOW due to sedimentation” ;
        QSSED:units = “g/kg/day” ;
        QSSED:missing_value = -9999.f ;
float QSSUP(time, z) ;
        QSSUP:long_name = “SNOW in saturated updrafts” ;
        QSSUP:units = “g/kg” ;
        QSSUP:missing_value = -9999.f ;
float QT(time, z) ;
        QT:long_name = “Total water (no rain/snow included)” ;
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```
                QT:units = “g/kg” ;
                QT:missing_value = -9999.f ;
        float QT2(time, z) ;
                QT2:long_name = “Variance of total water” ;
                QT2:units = “g2/kg2” ;
                QT2:missing_value = -9999.f ;
        float QTCDN(time, z) ;
                QTCDN:long_name = “Mean QT in downdraft core” ;
                QTCDN:units = “g/kg” ;
                QTCDN:missing_value = -9999.f ;
        float QTCLD(time, z) ;
                QTCLD:long_name = “Mean QT in cloud” ;
                QTCLD:units = “g/kg” ;
                QTCLD:missing_value = -9999.f ;
        float QTCOR(time, z) ;
                QTCOR:long_name = “Mean QT in core” ;
                QTCOR:units = “g/kg” ;
                QTCOR:missing_value = -9999.f ;
        float QTEND(time, z) ;
                QTEND:long_name = “Observed Large-Scale Moisture Tendency” ;
                QTEND:units = “g/kg/day” ;
                QTEND:missing_value = -9999.f ;
        float QTENV(time, z) ;
                QTENV:long_name = “Mean QT in unsaturated environment” ;
                QTENV:units = “g/kg” ;
                QTENV:missing_value = -9999.f ;
        float QTFLUX(time, z) ;
                QTFLUX:long_name = “Total (resolved + subgrid) total water (vapor+cloud) flux” ;
                QTFLUX:units = “W/m2” ;
                QTFLUX:missing_value = -9999.f ;
        float QTO(time, z) ;
                QTO:long_name = “TOTAL WATER (VAPOR + CLOUD LIQUID)” ;
                QTO:units = “g/kg” ;
                QTO:missing_value = -9999.f ;
        float QTO2(time, z) ;
                QTO2:long_name = “Variance of TOTAL WATER (VAPOR + CLOUD LIQUID)” ;
                QTO2:units = “(g/kg)^2” ;
                QTO2:missing_value = -9999.f ;
        float QTOADV(time, z) ;
                QTOADV:long_name = “Tendency of TOTAL WATER (VAPOR + CLOUD LIQUID) due to resolved vertical
advectio” ;
                QTOADV:units = “g/kg/day” ;
                QTOADV:missing_value = -9999.f ;
        float QTOCDN(time, z) ;
                QTOCDN:long_name = “TOTAL WATER (VAPOR + CLOUD LIQUID) in downdraft core” ;
                QTOCDN:units = “g/kg” ;
                QTOCDN:missing_value = -9999.f ;
        float QTOCLD(time, z) ;
                QTOCLD:long_name = “TOTAL WATER (VAPOR + CLOUD LIQUID) in cloud” ;
                QTOCLD:units = “g/kg” ;
                QTOCLD:missing_value = -9999.f ;
        float QTOCOR(time, z) ;
                QTOCOR:long_name = “TOTAL WATER (VAPOR + CLOUD LIQUID) in core” ;
                QTOCOR:units = “g/kg” ;
                QTOCOR:missing_value = -9999.f ;
        float QTODIFF(time, z) ;
                QTODIFF:long_name = “Tendency of TOTAL WATER (VAPOR + CLOUD LIQUID) due to vertical SGS
transport” ;
                QTODIFF:units = “g/kg/day” ;
                QTODIFF:missing_value = -9999.f ;
        float QTOENV(time, z) ;
                QTOENV:long_name = “TOTAL WATER (VAPOR + CLOUD LIQUID) in unsaturated environment” ;
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```
                QTOENV:units = “g/kg” ;
                QTOENV:missing_value = -9999.f ;
        float QTOFLXR(time, z) ;
                QTOFLXR:long_name = “Resolved flux of TOTAL WATER (VAPOR + CLOUD LIQUID)” ;
                QTOFLXR:units = “W/m2” ;
                QTOFLXR:missing_value = -9999.f ;
        float QTOFLXS(time, z) ;
                QTOFLXS:long_name = “Subgrid flux of TOTAL WATER (VAPOR + CLOUD LIQUID)” ;
                QTOFLXS:units = “W/m2” ;
                QTOFLXS:missing_value = -9999.f ;
        float QTOLSADV(time, z) ;
                QTOLSADV:long_name = “Tendency of TOTAL WATER (VAPOR + CLOUD LIQUID) due to large-scale
vertical advec” ;
                QTOLSADV:units = “g/kg/day” ;
                QTOLSADV:missing_value = -9999.f ;
        float QTOMPHY(time, z) ;
                QTOMPHY:long_name = “Tendency of TOTAL WATER (VAPOR + CLOUD LIQUID) due to microphysical
processes” ;
                QTOMPHY:units = “g/kg/day” ;
                QTOMPHY:missing_value = -9999.f ;
        float QTOSDFLX(time, z) ;
                QTOSDFLX:long_name = “Sedimentation flux of TOTAL WATER (VAPOR + CLOUD LIQUID)” ;
                QTOSDFLX:units = “W/m2” ;
                QTOSDFLX:missing_value = -9999.f ;
        float QTOSDN(time, z) ;
                QTOSDN:long_name = “TOTAL WATER (VAPOR + CLOUD LIQUID) in saturated downdrafts” ;
                QTOSDN:units = “g/kg” ;
                QTOSDN:missing_value = -9999.f ;
        float QTOSED(time, z) ;
                QTOSED:long_name = “Tendency of TOTAL WATER (VAPOR + CLOUD LIQUID) due to sedimentation” ;
                QTOSED:units = “g/kg/day” ;
                QTOSED:missing_value = -9999.f ;
        float QTOSUP(time, z) ;
                QTOSUP:long_name = “TOTAL WATER (VAPOR + CLOUD LIQUID) in saturated updrafts” ;
                QTOSUP:units = “g/kg” ;
                QTOSUP:missing_value = -9999.f ;
        float QTSDN(time, z) ;
                QTSDN:long_name = “Mean QT in saturated downdrafts” ;
                QTSDN:units = “g/kg” ;
                QTSDN:missing_value = -9999.f ;
        float QTSTOR(time, z) ;
                QTSTOR:long_name = “Total water storage” ;
                QTSTOR:units = “K/day” ;
                QTSTOR:missing_value = -9999.f ;
        float QTSUP(time, z) ;
                QTSUP:long_name = “Mean QT in saturated updrafts” ;
                QTSUP:units = “g/kg” ;
                QTSUP:missing_value = -9999.f ;
        float QTWCDN(time, z) ;
                QTWCDN:long_name = “QTW in downdraft core averaged over the whole domain” ;
                QTWCDN:units = “g/kg m/s” ;
                QTWCDN:missing_value = -9999.f ;
        float QTWCLD(time, z) ;
                QTWCLD:long_name = “QTW in cloud averaged over the whole domain” ;
                QTWCLD:units = “g/kg m/s” ;
                QTWCLD:missing_value = -9999.f ;
        float QTWCOR(time, z) ;
                QTWCOR:long_name = “QTW in core averaged over the whole domain” ;
                QTWCOR:units = “g/kg m/s” ;
                QTWCOR:missing_value = -9999.f ;
        float QTWENV(time, z) ;
                QTWENV:long_name = “QTW in unsaturated environment averaged over the whole domain” ;
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        QTWENV:units = “g/kg m/s” ;
        QTWENV:missing_value = -9999.f ;
float QTWSDN(time, z) ;
        QTWSDN:long_name = “QTW in saturated downdrafts averaged over the whole domain” ;
        QTWSDN:units = “g/kg m/s” ;
        QTWSDN:missing_value = -9999.f ;
float QTWSUP(time, z) ;
        QTWSUP:long_name = “QTW in saturated updrafts averaged over the whole domain” ;
        QTWSUP:units = “g/kg m/s” ;
        QTWSUP:missing_value = -9999.f ;
float QV(time, z) ;
        QV:long_name = “Water vapor” ;
        QV:units = “g/kg” ;
        QV:missing_value = -9999.f ;
float QVCDN(time, z) ;
        QVCDN:long_name = “Water vapor mixing ratio in downdraft core” ;
        QVCDN:units = “kg/kg” ;
        QVCDN:missing_value = -9999.f ;
float QVCLD(time, z) ;
        QVCLD:long_name = “Water vapor mixing ratio in cloud” ;
        QVCLD:units = “kg/kg” ;
        QVCLD:missing_value = -9999.f ;
float QVCOR(time, z) ;
        QVCOR:long_name = “Water vapor mixing ratio in core” ;
        QVCOR:units = “kg/kg” ;
        QVCOR:missing_value = -9999.f ;
float QVENV(time, z) ;
        QVENV:long_name = “Water vapor mixing ratio in unsaturated environment” ;
        QVENV:units = “kg/kg” ;
        QVENV:missing_value = -9999.f ;
float QVOBS(time, z) ;
        QVOBS:long_name = “Observed Water vapor” ;
        QVOBS:units = “g/kg” ;
        QVOBS:missing_value = -9999.f ;
float QVSDN(time, z) ;
        QVSDN:long_name = “Water vapor mixing ratio in saturated downdrafts” ;
        QVSDN:units = “kg/kg” ;
        QVSDN:missing_value = -9999.f ;
float QVSUP(time, z) ;
        QVSUP:long_name = “Water vapor mixing ratio in saturated updrafts” ;
        QVSUP:units = “kg/kg” ;
        QVSUP:missing_value = -9999.f ;
float QVTEND(time, z) ;
        QVTEND:long_name = “Large-Scale Vertical Advection Moisture Tendency” ;
        QVTEND:units = “g/kg/day” ;
        QVTEND:missing_value = -9999.f ;
float QWADV(time, z) ;
        QWADV:long_name = “Transport of total water flux” ;
        QWADV:units = “m s-2 K” ;
        QWADV:missing_value = -9999.f ;
float QWBUOY(time, z) ;
        QWBUOY:long_name = “Buoyancy production of total water flux” ;
        QWBUOY:units = “m s-2” ;
        QWBUOY:missing_value = -9999.f ;
float QWDIFF(time, z) ;
        QWDIFF:long_name = “Diffusion of total water flux” ;
        QWDIFF:units = “m s-2 K” ;
        QWDIFF:missing_value = -9999.f ;
float QWGRAD(time, z) ;
        QWGRAD:long_name = “Gradient production of total water flux” ;
        QWGRAD:units = “m s-2 K” ;
        QWGRAD:missing_value = -9999.f ;
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float QWPREC(time, z) ;
        QWPREC:long_name = “Precip. production of total water flux” ;
        QWPREC:units = “m s-2” ;
        QWPREC:missing_value = -9999.f ;
float QWPRES(time, z) ;
        QWPRES:long_name = “Pressure production of total water flux” ;
        QWPRES:units = “m s-2” ;
        QWPRES:missing_value = -9999.f ;
float RADLWDN(time, z) ;
        RADLWDN:long_name = “Downward longwave radiative flux” ;
        RADLWDN:units = “W/m2” ;
        RADLWDN:missing_value = -9999.f ;
float RADLWUP(time, z) ;
        RADLWUP:long_name = “Upward longwave radiative flux” ;
        RADLWUP:units = “W/m2” ;
        RADLWUP:missing_value = -9999.f ;
float RADQR(time, z) ;
        RADQR:long_name = “Radiative heating rate” ;
        RADQR:units = “K/day” ;
        RADQR:missing_value = -9999.f ;
float RADQRC(time, z) ;
        RADQRC:long_name = “Cloudy-sky Radiative heating rate” ;
        RADQRC:units = “K/day” ;
        RADQRC:missing_value = -9999.f ;
float RADQRLW(time, z) ;
        RADQRLW:long_name = “Longwave heating rate” ;
        RADQRLW:units = “K/day” ;
        RADQRLW:missing_value = -9999.f ;
float RADQRS(time, z) ;
        RADQRS:long_name = “Clear-sky Radiative heating rate” ;
        RADQRS:units = “K/day” ;
        RADQRS:missing_value = -9999.f ;
float RADQRSW(time, z) ;
        RADQRSW:long_name = “Shortwave heating rate” ;
        RADQRSW:units = “K/day” ;
        RADQRSW:missing_value = -9999.f ;
float RADSWDN(time, z) ;
        RADSWDN:long_name = “Downward shortwave radiative flux” ;
        RADSWDN:units = “W/m2” ;
        RADSWDN:missing_value = -9999.f ;
float RADSWUP(time, z) ;
        RADSWUP:long_name = “Upward shortwave radiative flux” ;
        RADSWUP:units = “W/m2” ;
        RADSWUP:missing_value = -9999.f ;
float RELH(time, z) ;
        RELH:long_name = “Relative humidity” ;
        RELH:units = “per cent” ;
        RELH:missing_value = -9999.f ;
float RHO(time, z) ;
        RHO:long_name = “Air density” ;
        RHO:units = “kg/m3” ;
        RHO:missing_value = -9999.f ;
float RUWCDN(time, z) ;
        RUWCDN:long_name = “RHOUW in downdraft core averaged over the whole domain” ;
        RUWCDN:units = “kg/m/s2” ;
        RUWCDN:missing_value = -9999.f ;
float RUWCLD(time, z) ;
        RUWCLD:long_name = “RHOUW in cloud averaged over the whole domain” ;
        RUWCLD:units = “kg/m/s2” ;
        RUWCLD:missing_value = -9999.f ;
float RUWCOR(time, z) ;
        RUWCOR:long_name = “RHOUW in core averaged over the whole domain” ;
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        RUWCOR:units = “kg/m/s2” ;
        RUWCOR:missing_value = -9999.f ;
float RUWENV(time, z) ;
        RUWENV:long_name = “RHOUW in unsaturated environment averaged over the whole domain” ;
        RUWENV:units = “kg/m/s2” ;
        RUWENV:missing_value = -9999.f ;
float RUWSDN(time, z) ;
        RUWSDN:long_name = “RHOUW in saturated downdrafts averaged over the whole domain” ;
        RUWSDN:units = “kg/m/s2” ;
        RUWSDN:missing_value = -9999.f ;
float RUWSUP(time, z) ;
        RUWSUP:long_name = “RHOUW in saturated updrafts averaged over the whole domain” ;
        RUWSUP:units = “kg/m/s2” ;
        RUWSUP:missing_value = -9999.f ;
float RVWCDN(time, z) ;
        RVWCDN:long_name = “RHOVW in downdraft core averaged over the whole domain” ;
        RVWCDN:units = “kg/m/s2” ;
        RVWCDN:missing_value = -9999.f ;
float RVWCLD(time, z) ;
        RVWCLD:long_name = “RHOVW in cloud averaged over the whole domain” ;
        RVWCLD:units = “kg/m/s2” ;
        RVWCLD:missing_value = -9999.f ;
float RVWCOR(time, z) ;
        RVWCOR:long_name = “RHOVW in core averaged over the whole domain” ;
        RVWCOR:units = “kg/m/s2” ;
        RVWCOR:missing_value = -9999.f ;
float RVWENV(time, z) ;
        RVWENV:long_name = “RHOVW in unsaturated environment averaged over the whole domain” ;
        RVWENV:units = “kg/m/s2” ;
        RVWENV:missing_value = -9999.f ;
float RVWSDN(time, z) ;
        RVWSDN:long_name = “RHOVW in saturated downdrafts averaged over the whole domain” ;
        RVWSDN:units = “kg/m/s2” ;
        RVWSDN:missing_value = -9999.f ;
float RVWSUP(time, z) ;
        RVWSUP:long_name = “RHOVW in saturated updrafts averaged over the whole domain” ;
        RVWSUP:units = “kg/m/s2” ;
        RVWSUP:missing_value = -9999.f ;
float RWP(time) ;
        RWP:long_name = “Rain Water Path” ;
        RWP:units = “g/m2” ;
float RWWCDN(time, z) ;
        RWWCDN:long_name = “RHOWW in downdraft core averaged over the whole domain” ;
        RWWCDN:units = “kg/m/s2” ;
        RWWCDN:missing_value = -9999.f ;
float RWWCLD(time, z) ;
        RWWCLD:long_name = “RHOWW in cloud averaged over the whole domain” ;
        RWWCLD:units = “kg/m/s2” ;
        RWWCLD:missing_value = -9999.f ;
float RWWCOR(time, z) ;
        RWWCOR:long_name = “RHOWW in core averaged over the whole domain” ;
        RWWCOR:units = “kg/m/s2” ;
        RWWCOR:missing_value = -9999.f ;
float RWWENV(time, z) ;
        RWWENV:long_name = “RHOWW in unsaturated environment averaged over the whole domain” ;
        RWWENV:units = “kg/m/s2” ;
        RWWENV:missing_value = -9999.f ;
float RWWSDN(time, z) ;
        RWWSDN:long_name = “RHOWW in saturated downdrafts averaged over the whole domain” ;
        RWWSDN:units = “kg/m/s2” ;
        RWWSDN:missing_value = -9999.f ;
float RWWSUP(time, z) ;
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        RWWSUP:long_name = “RHOWW in saturated updrafts averaged over the whole domain” ;
        RWWSUP:units = “kg/m/s2” ;
        RWWSUP:missing_value = -9999.f ;
float SDN(time, z) ;
        SDN:long_name = “saturated downdrafts Fraction” ;
        SDN:units = “” ;
        SDN:missing_value = -9999.f ;
float SHEAR(time, z) ;
        SHEAR:long_name = “Shear production of TKE (resolved)” ;
        SHEAR:units = “m2/s3” ;
        SHEAR:missing_value = -9999.f ;
float SHEARS(time, z) ;
        SHEARS:long_name = “Shear production of TKE (SGS)” ;
        SHEARS:units = “m2/s3” ;
        SHEARS:missing_value = -9999.f ;
float SHF(time) ;
        SHF:long_name = “Sensible Heat Flux” ;
        SHF:units = “W/m2” ;
float SHFOBS(time) ;
        SHFOBS:long_name = “Observed Sensible Heat Flux” ;
        SHFOBS:units = “SHFOBS” ;
float SOLIN(time) ;
        SOLIN:long_name = “Incoming SW flux at TOA” ;
        SOLIN:units = “W/m2” ;
float SSE(time, z) ;
        SSE:long_name = “Saturation static energy” ;
        SSE:units = “K” ;
        SSE:missing_value = -9999.f ;
float SST(time) ;
        SST:long_name = “SST” ;
        SST:units = “K” ;
float SSTOBS(time) ;
        SSTOBS:long_name = “Observed SST” ;
        SSTOBS:units = “K” ;
float SUP(time, z) ;
        SUP:long_name = “saturated updrafts Fraction” ;
        SUP:units = “” ;
        SUP:missing_value = -9999.f ;
float SWDS(time) ;
        SWDS:long_name = “Downward SW flux at sfc” ;
        SWDS:units = “W/m2” ;
float SWNS(time) ;
        SWNS:long_name = “Net SW flux at sfc” ;
        SWNS:units = “W/m2” ;
float SWNSC(time) ;
        SWNSC:long_name = “Net SW flux at sfc (Clear Sky)” ;
        SWNSC:units = “W/m2” ;
float SWNT(time) ;
        SWNT:long_name = “Net SW flux at Top-of-Model” ;
        SWNT:units = “W/m2” ;
float SWNTOA(time) ;
        SWNTOA:long_name = “Net SW flux at TOA” ;
        SWNTOA:units = “W/m2” ;
float SWNTOAC(time) ;
        SWNTOAC:long_name = “Net SW flux at TOA (Clear Sky)” ;
        SWNTOAC:units = “W/m2” ;
float SWP(time) ;
        SWP:long_name = “Snow Water Path” ;
        SWP:units = “g/m2” ;
float T2ADVTR(time, z) ;
        T2ADVTR:long_name = “Transport of l.w.s.e variance” ;
        T2ADVTR:units = “K2/s” ;
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        T2ADVTR:missing_value = -9999.f ;
float T2DIFTR(time, z) ;
        T2DIFTR:long_name = “SGS transport of l.w.s.e variance” ;
        T2DIFTR:units = “K2/s” ;
        T2DIFTR:missing_value = -9999.f ;
float T2DISSIP(time, z) ;
        T2DISSIP:long_name = “Dissipation of l.w.s.e variance” ;
        T2DISSIP:units = “K2/s” ;
        T2DISSIP:missing_value = -9999.f ;
float T2GRAD(time, z) ;
        T2GRAD:long_name = “Gradient production of l.w.s.e variance” ;
        T2GRAD:units = “K2/s” ;
        T2GRAD:missing_value = -9999.f ;
float T2PREC(time, z) ;
        T2PREC:long_name = “Precipitation production of l.w.s.e variance” ;
        T2PREC:units = “K2/s” ;
        T2PREC:missing_value = -9999.f ;
float TABS(time, z) ;
        TABS:long_name = “Absolute temperature” ;
        TABS:units = “K” ;
        TABS:missing_value = -9999.f ;
float TABSOBS(time, z) ;
        TABSOBS:long_name = “Observed Absolute temperature” ;
        TABSOBS:units = “K” ;
        TABSOBS:missing_value = -9999.f ;
float TACDN(time, z) ;
        TACDN:long_name = “Mean TABS in downdraft core” ;
        TACDN:units = “K” ;
        TACDN:missing_value = -9999.f ;
float TACLD(time, z) ;
        TACLD:long_name = “Mean TABS in cloud” ;
        TACLD:units = “K” ;
        TACLD:missing_value = -9999.f ;
float TACOR(time, z) ;
        TACOR:long_name = “Mean TABS in core” ;
        TACOR:units = “K” ;
        TACOR:missing_value = -9999.f ;
float TAENV(time, z) ;
        TAENV:long_name = “Mean TABS in unsaturated environment” ;
        TAENV:units = “K” ;
        TAENV:missing_value = -9999.f ;
float TASDN(time, z) ;
        TASDN:long_name = “Mean TABS in saturated downdrafts” ;
        TASDN:units = “K” ;
        TASDN:missing_value = -9999.f ;
float TASUP(time, z) ;
        TASUP:long_name = “Mean TABS in saturated updrafts” ;
        TASUP:units = “K” ;
        TASUP:missing_value = -9999.f ;
float TAUQC(time, z) ;
        TAUQC:long_name = “Approx optical depth of cloud liquid water” ;
        TAUQC:units = “1” ;
        TAUQC:missing_value = -9999.f ;
float TAUQG(time, z) ;
        TAUQG:long_name = “Approx optical depth of GRAUPEL” ;
        TAUQG:units = “1” ;
        TAUQG:missing_value = -9999.f ;
float TAUQI(time, z) ;
        TAUQI:long_name = “Approx optical depth of CLOUD ICE” ;
        TAUQI:units = “1” ;
        TAUQI:missing_value = -9999.f ;
float TAUQR(time, z) ;
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        TAUQR:long_name = “Approx optical depth of RAIN” ;
        TAUQR:units = “1” ;
        TAUQR:missing_value = -9999.f ;
float TAUQS(time, z) ;
        TAUQS:long_name = “Approx optical depth of SNOW” ;
        TAUQS:units = “1” ;
        TAUQS:missing_value = -9999.f ;
float THETA(time, z) ;
        THETA:long_name = “Potential temperature” ;
        THETA:units = “K” ;
        THETA:missing_value = -9999.f ;
float THETAE(time, z) ;
        THETAE:long_name = “Equivalent (generalized) potential temperature” ;
        THETAE:units = “K” ;
        THETAE:missing_value = -9999.f ;
float THETAL(time, z) ;
        THETAL:long_name = “Liquid water potential temperature” ;
        THETAL:units = “K” ;
        THETAL:missing_value = -9999.f ;
float THETAV(time, z) ;
        THETAV:long_name = “Virtual potential temperature” ;
        THETAV:units = “K” ;
        THETAV:missing_value = -9999.f ;
float THTEND(time, z) ;
        THTEND:long_name = “Large-Scale Horizontal Advection Temperature Tendency” ;
        THTEND:units = “K/day” ;
        THTEND:missing_value = -9999.f ;
float TK(time, z) ;
        TK:long_name = “Eddy viscosity” ;
        TK:units = “m2/s” ;
        TK:missing_value = -9999.f ;
float TKE(time, z) ;
        TKE:long_name = “Turbulent kinetic energy (Resolved)” ;
        TKE:units = “m2/s2” ;
        TKE:missing_value = -9999.f ;
float TKES(time, z) ;
        TKES:long_name = “Turbulent kinetic energy (SGS)” ;
        TKES:units = “m2/s2” ;
        TKES:missing_value = -9999.f ;
float TKH(time, z) ;
        TKH:long_name = “Eddy diffusivity” ;
        TKH:units = “m2/s” ;
        TKH:missing_value = -9999.f ;
float TL(time, z) ;
        TL:long_name = “Liquid water static energy” ;
        TL:units = “K” ;
        TL:missing_value = -9999.f ;
float TL2(time, z) ;
        TL2:long_name = “Variance of l.w.stat.energy” ;
        TL2:units = “K2” ;
        TL2:missing_value = -9999.f ;
float TLCDN(time, z) ;
        TLCDN:long_name = “Mean liquid-ice static energy in downdraft core” ;
        TLCDN:units = “K” ;
        TLCDN:missing_value = -9999.f ;
float TLCLD(time, z) ;
        TLCLD:long_name = “Mean liquid-ice static energy in cloud” ;
        TLCLD:units = “K” ;
        TLCLD:missing_value = -9999.f ;
float TLCOR(time, z) ;
        TLCOR:long_name = “Mean liquid-ice static energy in core” ;
        TLCOR:units = “K” ;
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        TLCOR:missing_value = -9999.f ;
float TLENV(time, z) ;
        TLENV:long_name = “Mean liquid-ice static energy in unsaturated environment” ;
        TLENV:units = “K” ;
        TLENV:missing_value = -9999.f ;
float TLFLUX(time, z) ;
        TLFLUX:long_name = “Liquid water static energy flux (Total)” ;
        TLFLUX:units = “W/m2” ;
        TLFLUX:missing_value = -9999.f ;
float TLFLUXS(time, z) ;
        TLFLUXS:long_name = “Liquid water static energy flux (SGS)” ;
        TLFLUXS:units = “W/m2” ;
        TLFLUXS:missing_value = -9999.f ;
float TLSDN(time, z) ;
        TLSDN:long_name = “Mean liquid-ice static energy in saturated downdrafts” ;
        TLSDN:units = “K” ;
        TLSDN:missing_value = -9999.f ;
float TLSUP(time, z) ;
        TLSUP:long_name = “Mean liquid-ice static energy in saturated updrafts” ;
        TLSUP:units = “K” ;
        TLSUP:missing_value = -9999.f ;
float TLWCDN(time, z) ;
        TLWCDN:long_name = “TLW in downdraft core averaged over the whole domain” ;
        TLWCDN:units = “Km/s” ;
        TLWCDN:missing_value = -9999.f ;
float TLWCLD(time, z) ;
        TLWCLD:long_name = “TLW in cloud averaged over the whole domain” ;
        TLWCLD:units = “Km/s” ;
        TLWCLD:missing_value = -9999.f ;
float TLWCOR(time, z) ;
        TLWCOR:long_name = “TLW in core averaged over the whole domain” ;
        TLWCOR:units = “Km/s” ;
        TLWCOR:missing_value = -9999.f ;
float TLWENV(time, z) ;
        TLWENV:long_name = “TLW in unsaturated environment averaged over the whole domain” ;
        TLWENV:units = “Km/s” ;
        TLWENV:missing_value = -9999.f ;
float TLWSDN(time, z) ;
        TLWSDN:long_name = “TLW in saturated downdrafts averaged over the whole domain” ;
        TLWSDN:units = “Km/s” ;
        TLWSDN:missing_value = -9999.f ;
float TLWSUP(time, z) ;
        TLWSUP:long_name = “TLW in saturated updrafts averaged over the whole domain” ;
        TLWSUP:units = “Km/s” ;
        TLWSUP:missing_value = -9999.f ;
float TNUDGE(time, z) ;
        TNUDGE:long_name = “Large-Scale Temperature Nudging” ;
        TNUDGE:units = “K/day” ;
        TNUDGE:missing_value = -9999.f ;
float TQ(time, z) ;
        TQ:long_name = “CoVariance of HL and QT” ;
        TQ:units = “K2” ;
        TQ:missing_value = -9999.f ;
float TTEND(time, z) ;
        TTEND:long_name = “Observed Large-Scale Temperature Tendency” ;
        TTEND:units = “K/day” ;
        TTEND:missing_value = -9999.f ;
float TVCDN(time, z) ;
        TVCDN:long_name = “Mean THETAV in downdraft core” ;
        TVCDN:units = “K” ;
        TVCDN:missing_value = -9999.f ;
float TVCDNA(time, z) ;
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        TVCDNA:long_name = “Mean THETAV anomaly in downdraft core” ;
        TVCDNA:units = “K” ;
        TVCDNA:missing_value = -9999.f ;
float TVCLD(time, z) ;
        TVCLD:long_name = “Mean THETAV in cloud” ;
        TVCLD:units = “K” ;
        TVCLD:missing_value = -9999.f ;
float TVCLDA(time, z) ;
        TVCLDA:long_name = “Mean THETAV anomaly in cloud” ;
        TVCLDA:units = “K” ;
        TVCLDA:missing_value = -9999.f ;
float TVCOR(time, z) ;
        TVCOR:long_name = “Mean THETAV in core” ;
        TVCOR:units = “K” ;
        TVCOR:missing_value = -9999.f ;
float TVCORA(time, z) ;
        TVCORA:long_name = “Mean THETAV anomaly in core” ;
        TVCORA:units = “K” ;
        TVCORA:missing_value = -9999.f ;
float TVENV(time, z) ;
        TVENV:long_name = “Mean THETAV in unsaturated environment” ;
        TVENV:units = “K” ;
        TVENV:missing_value = -9999.f ;
float TVENVA(time, z) ;
        TVENVA:long_name = “Mean THETAV anomaly in unsaturated environment” ;
        TVENVA:units = “K” ;
        TVENVA:missing_value = -9999.f ;
float TVFLUX(time, z) ;
        TVFLUX:long_name = “Buoyancy flux (Resolved)” ;
        TVFLUX:units = “W/m2” ;
        TVFLUX:missing_value = -9999.f ;
float TVSDN(time, z) ;
        TVSDN:long_name = “Mean THETAV in saturated downdrafts” ;
        TVSDN:units = “K” ;
        TVSDN:missing_value = -9999.f ;
float TVSDNA(time, z) ;
        TVSDNA:long_name = “Mean THETAV anomaly in saturated downdrafts” ;
        TVSDNA:units = “K” ;
        TVSDNA:missing_value = -9999.f ;
float TVSUP(time, z) ;
        TVSUP:long_name = “Mean THETAV in saturated updrafts” ;
        TVSUP:units = “K” ;
        TVSUP:missing_value = -9999.f ;
float TVSUPA(time, z) ;
        TVSUPA:long_name = “Mean THETAV anomaly in saturated updrafts” ;
        TVSUPA:units = “K” ;
        TVSUPA:missing_value = -9999.f ;
float TVTEND(time, z) ;
        TVTEND:long_name = “Large-Scale Vertical Advection Temperature Tendency” ;
        TVTEND:units = “K/day” ;
        TVTEND:missing_value = -9999.f ;
float TVWCDN(time, z) ;
        TVWCDN:long_name = “TVW in downdraft core averaged over the whole domain” ;
        TVWCDN:units = “Km/s” ;
        TVWCDN:missing_value = -9999.f ;
float TVWCLD(time, z) ;
        TVWCLD:long_name = “TVW in cloud averaged over the whole domain” ;
        TVWCLD:units = “Km/s” ;
        TVWCLD:missing_value = -9999.f ;
float TVWCOR(time, z) ;
        TVWCOR:long_name = “TVW in core averaged over the whole domain” ;
        TVWCOR:units = “Km/s” ;
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        TVWCOR:missing_value = -9999.f ;
float TVWENV(time, z) ;
        TVWENV:long_name = "TVW in unsaturated environment averaged over the whole domain" ;
        TVWENV:units = "Km/s" ;
        TVWENV:missing_value = -9999.f ;
float TVWSDN(time, z) ;
        TVWSDN:long_name = "TVW in saturated downdrafts averaged over the whole domain" ;
        TVWSDN:units = "Km/s" ;
        TVWSDN:missing_value = -9999.f ;
float TVWSUP(time, z) ;
        TVWSUP:long_name = "TVW in saturated updrafts averaged over the whole domain" ;
        TVWSUP:units = "Km/s" ;
        TVWSUP:missing_value = -9999.f ;
float TWADV(time, z) ;
        TWADV:long_name = "Transport of l.w.s.e flux" ;
        TWADV:units = "m s-2 K" ;
        TWADV:missing_value = -9999.f ;
float TWBUOY(time, z) ;
        TWBUOY:long_name = "Buoyancy production of l.w.s.e flux" ;
        TWBUOY:units = "m s-2 K" ;
        TWBUOY:missing_value = -9999.f ;
float TWDIFF(time, z) ;
        TWDIFF:long_name = "Diffusion of l.w.s.e flux" ;
        TWDIFF:units = "m s-2 K" ;
        TWDIFF:missing_value = -9999.f ;
float TWGRAD(time, z) ;
        TWGRAD:long_name = "Gradient production of l.w.s.e flux" ;
        TWGRAD:units = "m s-2 K" ;
        TWGRAD:missing_value = -9999.f ;
float TWPREC(time, z) ;
        TWPREC:long_name = "Precip. production of l.w.s.e flux" ;
        TWPREC:units = "m s-2 K" ;
        TWPREC:missing_value = -9999.f ;
float TWPRES(time, z) ;
        TWPRES:long_name = "Pressure production of l.w.s.e flux" ;
        TWPRES:units = "m s-2 K" ;
        TWPRES:missing_value = -9999.f ;
float U(time, z) ;
        U:long_name = "x wind component" ;
        U:units = "m/s" ;
        U:missing_value = -9999.f ;
float U2(time, z) ;
        U2:long_name = "Variance of the x wind component" ;
        U2:units = "m2/s2" ;
        U2:missing_value = -9999.f ;
float UADV(time, z) ;
        UADV:long_name = "Resolved zonal momentum flux convergence" ;
        UADV:units = "m/s/day" ;
        UADV:missing_value = -9999.f ;
float UCDN(time, z) ;
        UCDN:long_name = "Mean U in downdraft core" ;
        UCDN:units = "m/s" ;
        UCDN:missing_value = -9999.f ;
float UCDNA(time, z) ;
        UCDNA:long_name = "Mean U anomaly in downdraft core" ;
        UCDNA:units = "m/s" ;
        UCDNA:missing_value = -9999.f ;
float UCLD(time, z) ;
        UCLD:long_name = "Mean U in cloud" ;
        UCLD:units = "m/s" ;
        UCLD:missing_value = -9999.f ;
float UCLDA(time, z) ;
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        UCLDA:long_name = “Mean U anomaly in cloud” ;
        UCLDA:units = “m/s” ;
        UCLDA:missing_value = -9999.f ;
float UCOR(time, z) ;
        UCOR:long_name = “Mean U in core” ;
        UCOR:units = “m/s” ;
        UCOR:missing_value = -9999.f ;
float UCORA(time, z) ;
        UCORA:long_name = “Mean U anomaly in core” ;
        UCORA:units = “m/s” ;
        UCORA:missing_value = -9999.f ;
float UDIFF(time, z) ;
        UDIFF:long_name = “Subgrid zonal momentum flux convergence” ;
        UDIFF:units = “m/s/day” ;
        UDIFF:missing_value = -9999.f ;
float UENV(time, z) ;
        UENV:long_name = “Mean U in unsaturated environment” ;
        UENV:units = “m/s” ;
        UENV:missing_value = -9999.f ;
float UENVA(time, z) ;
        UENVA:long_name = “Mean U anomaly in unsaturated environment” ;
        UENVA:units = “m/s” ;
        UENVA:missing_value = -9999.f ;
float ULSADVV(time, z) ;
        ULSADVV:long_name = “Large-scale vertical advection of Zonal velocity” ;
        ULSADVV:units = “m/s/day” ;
        ULSADVV:missing_value = -9999.f ;
float UMAX(time) ;
        UMAX:long_name = “Maximum Horizontal Wind” ;
        UMAX:units = “m/s” ;
float UNUDGE(time, z) ;
        UNUDGE:long_name = “Zonal velocity nudging” ;
        UNUDGE:units = “m/s/day” ;
        UNUDGE:missing_value = -9999.f ;
float UOBS(time, z) ;
        UOBS:long_name = “Observed x wind component” ;
        UOBS:units = “m/s” ;
        UOBS:missing_value = -9999.f ;
float UPGFCDN(time, z) ;
        UPGFCDN:long_name = “Zonal pressure gradient in downdraft core” ;
        UPGFCDN:units = “m/s2” ;
        UPGFCDN:missing_value = -9999.f ;
float UPGFCLD(time, z) ;
        UPGFCLD:long_name = “Zonal pressure gradient in cloud” ;
        UPGFCLD:units = “m/s2” ;
        UPGFCLD:missing_value = -9999.f ;
float UPGFCOR(time, z) ;
        UPGFCOR:long_name = “Zonal pressure gradient in core” ;
        UPGFCOR:units = “m/s2” ;
        UPGFCOR:missing_value = -9999.f ;
float UPGFENV(time, z) ;
        UPGFENV:long_name = “Zonal pressure gradient in unsaturated environment” ;
        UPGFENV:units = “m/s2” ;
        UPGFENV:missing_value = -9999.f ;
float UPGFSDN(time, z) ;
        UPGFSDN:long_name = “Zonal pressure gradient in saturated downdrafts” ;
        UPGFSDN:units = “m/s2” ;
        UPGFSDN:missing_value = -9999.f ;
float UPGFSUP(time, z) ;
        UPGFSUP:long_name = “Zonal pressure gradient in saturated updrafts” ;
        UPGFSUP:units = “m/s2” ;
        UPGFSUP:missing_value = -9999.f ;
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float URESID(time, z) ;
        URESID:long_name = “Zonal velocity budget residual” ;
        URESID:units = “m/s/day” ;
        URESID:missing_value = -9999.f ;
float USDN(time, z) ;
        USDN:long_name = “Mean U in saturated downdrafts” ;
        USDN:units = “m/s” ;
        USDN:missing_value = -9999.f ;
float USDNA(time, z) ;
        USDNA:long_name = “Mean U anomaly in saturated downdrafts” ;
        USDNA:units = “m/s” ;
        USDNA:missing_value = -9999.f ;
float USTOR(time, z) ;
        USTOR:long_name = “Zonal velocity storage” ;
        USTOR:units = “m/s/day” ;
        USTOR:missing_value = -9999.f ;
float USUP(time, z) ;
        USUP:long_name = “Mean U in saturated updrafts” ;
        USUP:units = “m/s” ;
        USUP:missing_value = -9999.f ;
float USUPA(time, z) ;
        USUPA:long_name = “Mean U anomaly in saturated updrafts” ;
        USUPA:units = “m/s” ;
        USUPA:missing_value = -9999.f ;
float UTENDCOR(time, z) ;
        UTENDCOR:long_name = “Zonal velocity tendency due to Coriolis effect” ;
        UTENDCOR:units = “m/s/day” ;
        UTENDCOR:missing_value = -9999.f ;
float UW(time, z) ;
        UW:long_name = “x-momentum flux (Total)” ;
        UW:units = “m2/s2” ;
        UW:missing_value = -9999.f ;
float UWCDN(time, z) ;
        UWCDN:long_name = “UW in downdraft core” ;
        UWCDN:units = “m2/s2” ;
        UWCDN:missing_value = -9999.f ;
float UWCLD(time, z) ;
        UWCLD:long_name = “UW in cloud” ;
        UWCLD:units = “m2/s2” ;
        UWCLD:missing_value = -9999.f ;
float UWCOR(time, z) ;
        UWCOR:long_name = “UW in core” ;
        UWCOR:units = “m2/s2” ;
        UWCOR:missing_value = -9999.f ;
float UWENV(time, z) ;
        UWENV:long_name = “UW in unsaturated environment” ;
        UWENV:units = “m2/s2” ;
        UWENV:missing_value = -9999.f ;
float UWSB(time, z) ;
        UWSB:long_name = “x-momentum flux (SGS)” ;
        UWSB:units = “m2/s2” ;
        UWSB:missing_value = -9999.f ;
float UWSBCDN(time, z) ;
        UWSBCDN:long_name = “Subgrid UW in downdraft core” ;
        UWSBCDN:units = “m2/s2” ;
        UWSBCDN:missing_value = -9999.f ;
float UWSBCLD(time, z) ;
        UWSBCLD:long_name = “Subgrid UW in cloud” ;
        UWSBCLD:units = “m2/s2” ;
        UWSBCLD:missing_value = -9999.f ;
float UWSBCOR(time, z) ;
        UWSBCOR:long_name = “Subgrid UW in core” ;
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        UWSBCOR:units = “m2/s2” ;
        UWSBCOR:missing_value = -9999.f ;
float UWSBENV(time, z) ;
        UWSBENV:long_name = “Subgrid UW in unsaturated environment” ;
        UWSBENV:units = “m2/s2” ;
        UWSBENV:missing_value = -9999.f ;
float UWSBSDN(time, z) ;
        UWSBSDN:long_name = “Subgrid UW in saturated downdrafts” ;
        UWSBSDN:units = “m2/s2” ;
        UWSBSDN:missing_value = -9999.f ;
float UWSBSUP(time, z) ;
        UWSBSUP:long_name = “Subgrid UW in saturated updrafts” ;
        UWSBSUP:units = “m2/s2” ;
        UWSBSUP:missing_value = -9999.f ;
float UWSDN(time, z) ;
        UWSDN:long_name = “UW in saturated downdrafts” ;
        UWSDN:units = “m2/s2” ;
        UWSDN:missing_value = -9999.f ;
float UWSUP(time, z) ;
        UWSUP:long_name = “UW in saturated updrafts” ;
        UWSUP:units = “m2/s2” ;
        UWSUP:missing_value = -9999.f ;
float V(time, z) ;
        V:long_name = “y wind component” ;
        V:units = “m/s” ;
        V:missing_value = -9999.f ;
float V2(time, z) ;
        V2:long_name = “Variance of the y wind component” ;
        V2:units = “m2/s2” ;
        V2:missing_value = -9999.f ;
float VADV(time, z) ;
        VADV:long_name = “Resolved meridioinal momentum flux convergence” ;
        VADV:units = “m/s/day” ;
        VADV:missing_value = -9999.f ;
float VCDN(time, z) ;
        VCDN:long_name = “Mean V in downdraft core” ;
        VCDN:units = “m/s” ;
        VCDN:missing_value = -9999.f ;
float VCDNA(time, z) ;
        VCDNA:long_name = “Mean V anomaly in downdraft core” ;
        VCDNA:units = “m/s” ;
        VCDNA:missing_value = -9999.f ;
float VCLD(time, z) ;
        VCLD:long_name = “Mean V in cloud” ;
        VCLD:units = “m/s” ;
        VCLD:missing_value = -9999.f ;
float VCLDA(time, z) ;
        VCLDA:long_name = “Mean V anomaly in cloud” ;
        VCLDA:units = “m/s” ;
        VCLDA:missing_value = -9999.f ;
float VCOR(time, z) ;
        VCOR:long_name = “Mean V in core” ;
        VCOR:units = “m/s” ;
        VCOR:missing_value = -9999.f ;
float VCORA(time, z) ;
        VCORA:long_name = “Mean V anomaly in core” ;
        VCORA:units = “m/s” ;
        VCORA:missing_value = -9999.f ;
float VDIFF(time, z) ;
        VDIFF:long_name = “Subgrid meridioinal momentum flux convergence” ;
        VDIFF:units = “m/s/day” ;
        VDIFF:missing_value = -9999.f ;
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float VENV(time, z) ;
        VENV:long_name = “Mean V in unsaturated environment” ;
        VENV:units = “m/s” ;
        VENV:missing_value = -9999.f ;
float VENVA(time, z) ;
        VENVA:long_name = “Mean V anomaly in unsaturated environment” ;
        VENVA:units = “m/s” ;
        VENVA:missing_value = -9999.f ;
float VLSADVV(time, z) ;
        VLSADVV:long_name = “Large-scale vertical advection of meridional velocity” ;
        VLSADVV:units = “m/s/day” ;
        VLSADVV:missing_value = -9999.f ;
float VNUDGE(time, z) ;
        VNUDGE:long_name = “Meridional velocity nudging” ;
        VNUDGE:units = “m/s/day” ;
        VNUDGE:missing_value = -9999.f ;
float VOBS(time, z) ;
        VOBS:long_name = “Observed y wind component” ;
        VOBS:units = “m/s” ;
        VOBS:missing_value = -9999.f ;
float VPGFCDN(time, z) ;
        VPGFCDN:long_name = “Meridional pressure gradient in downdraft core” ;
        VPGFCDN:units = “m/s2” ;
        VPGFCDN:missing_value = -9999.f ;
float VPGFCLD(time, z) ;
        VPGFCLD:long_name = “Meridional pressure gradient in cloud” ;
        VPGFCLD:units = “m/s2” ;
        VPGFCLD:missing_value = -9999.f ;
float VPGFCOR(time, z) ;
        VPGFCOR:long_name = “Meridional pressure gradient in core” ;
        VPGFCOR:units = “m/s2” ;
        VPGFCOR:missing_value = -9999.f ;
float VPGFENV(time, z) ;
        VPGFENV:long_name = “Meridional pressure gradient in unsaturated environment” ;
        VPGFENV:units = “m/s2” ;
        VPGFENV:missing_value = -9999.f ;
float VPGFSDN(time, z) ;
        VPGFSDN:long_name = “Meridional pressure gradient in saturated downdrafts” ;
        VPGFSDN:units = “m/s2” ;
        VPGFSDN:missing_value = -9999.f ;
float VPGFSUP(time, z) ;
        VPGFSUP:long_name = “Meridional pressure gradient in saturated updrafts” ;
        VPGFSUP:units = “m/s2” ;
        VPGFSUP:missing_value = -9999.f ;
float VRESID(time, z) ;
        VRESID:long_name = “Meridional velocity budget residual” ;
        VRESID:units = “m/s/day” ;
        VRESID:missing_value = -9999.f ;
float VSDN(time, z) ;
        VSDN:long_name = “Mean V in saturated downdrafts” ;
        VSDN:units = “m/s” ;
        VSDN:missing_value = -9999.f ;
float VSDNA(time, z) ;
        VSDNA:long_name = “Mean V anomaly in saturated downdrafts” ;
        VSDNA:units = “m/s” ;
        VSDNA:missing_value = -9999.f ;
float VSTOR(time, z) ;
        VSTOR:long_name = “Meridional velocity storage” ;
        VSTOR:units = “m/s/day” ;
        VSTOR:missing_value = -9999.f ;
float VSUP(time, z) ;
        VSUP:long_name = “Mean V in saturated updrafts” ;
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        VSUP:units = “m/s” ;
        VSUP:missing_value = -9999.f ;
float VSUPA(time, z) ;
        VSUPA:long_name = “Mean V anomaly in saturated updrafts” ;
        VSUPA:units = “m/s” ;
        VSUPA:missing_value = -9999.f ;
float VTENDCOR(time, z) ;
        VTENDCOR:long_name = “Meridional velocity budget residual” ;
        VTENDCOR:units = “m/s/day” ;
        VTENDCOR:missing_value = -9999.f ;
float VW(time, z) ;
        VW:long_name = “y-momentum flux (Total)” ;
        VW:units = “m2/s2” ;
        VW:missing_value = -9999.f ;
float VWCDN(time, z) ;
        VWCDN:long_name = “VW in downdraft core” ;
        VWCDN:units = “m2/s2” ;
        VWCDN:missing_value = -9999.f ;
float VWCLD(time, z) ;
        VWCLD:long_name = “VW in cloud” ;
        VWCLD:units = “m2/s2” ;
        VWCLD:missing_value = -9999.f ;
float VWCOR(time, z) ;
        VWCOR:long_name = “VW in core” ;
        VWCOR:units = “m2/s2” ;
        VWCOR:missing_value = -9999.f ;
float VWENV(time, z) ;
        VWENV:long_name = “VW in unsaturated environment” ;
        VWENV:units = “m2/s2” ;
        VWENV:missing_value = -9999.f ;
float VWSB(time, z) ;
        VWSB:long_name = “y-momentum flux (SGS)” ;
        VWSB:units = “m2/s2” ;
        VWSB:missing_value = -9999.f ;
float VWSBCDN(time, z) ;
        VWSBCDN:long_name = “Subgrid VW in downdraft core” ;
        VWSBCDN:units = “m2/s2” ;
        VWSBCDN:missing_value = -9999.f ;
float VWSBCLD(time, z) ;
        VWSBCLD:long_name = “Subgrid VW in cloud” ;
        VWSBCLD:units = “m2/s2” ;
        VWSBCLD:missing_value = -9999.f ;
float VWSBCOR(time, z) ;
        VWSBCOR:long_name = “Subgrid VW in core” ;
        VWSBCOR:units = “m2/s2” ;
        VWSBCOR:missing_value = -9999.f ;
float VWSBENV(time, z) ;
        VWSBENV:long_name = “Subgrid VW in unsaturated environment” ;
        VWSBENV:units = “m2/s2” ;
        VWSBENV:missing_value = -9999.f ;
float VWSBSDN(time, z) ;
        VWSBSDN:long_name = “Subgrid VW in saturated downdrafts” ;
        VWSBSDN:units = “m2/s2” ;
        VWSBSDN:missing_value = -9999.f ;
float VWSBSUP(time, z) ;
        VWSBSUP:long_name = “Subgrid VW in saturated updrafts” ;
        VWSBSUP:units = “m2/s2” ;
        VWSBSUP:missing_value = -9999.f ;
float VWSDN(time, z) ;
        VWSDN:long_name = “VW in saturated downdrafts” ;
        VWSDN:units = “m2/s2” ;
        VWSDN:missing_value = -9999.f ;
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float VWSUP(time, z) ;
        VWSUP:long_name = "VW in saturated updrafts" ;
        VWSUP:units = "m2/s2" ;
        VWSUP:missing_value = -9999.f ;
float W2(time, z) ;
        W2:long_name = "Variance of the z wind component" ;
        W2:units = "m2/s2" ;
        W2:missing_value = -9999.f ;
float W2ADV(time, z) ;
        W2ADV:long_name = "WU advection (Resolved)" ;
        W2ADV:units = "m2/s3" ;
        W2ADV:missing_value = -9999.f ;
float W2BUOY(time, z) ;
        W2BUOY:long_name = "W2 buoyancy (Resolved)" ;
        W2BUOY:units = "m2/s3" ;
        W2BUOY:missing_value = -9999.f ;
float W2DIFF(time, z) ;
        W2DIFF:long_name = "W2 diffusion (Resolved)" ;
        W2DIFF:units = "m2/s3" ;
        W2DIFF:missing_value = -9999.f ;
float W2PRES(time, z) ;
        W2PRES:long_name = "W2 pressure (Resolved)" ;
        W2PRES:units = "m2/s3" ;
        W2PRES:missing_value = -9999.f ;
float W2REDIS(time, z) ;
        W2REDIS:long_name = "W2 pressure redistribution(Resolved)" ;
        W2REDIS:units = "m2/s3" ;
        W2REDIS:missing_value = -9999.f ;
float W3(time, z) ;
        W3:long_name = "Third moment of the vertical velocity" ;
        W3:units = "m3/s3" ;
        W3:missing_value = -9999.f ;
float WCDN(time, z) ;
        WCDN:long_name = "Mean W in downdraft core" ;
        WCDN:units = "m/s" ;
        WCDN:missing_value = -9999.f ;
float WCDNA(time, z) ;
        WCDNA:long_name = "W in downdraft core averaged over the whole domain" ;
        WCDNA:units = "m/s" ;
        WCDNA:missing_value = -9999.f ;
float WCLD(time, z) ;
        WCLD:long_name = "Mean W in cloud" ;
        WCLD:units = "m/s" ;
        WCLD:missing_value = -9999.f ;
float WCLDA(time, z) ;
        WCLDA:long_name = "W in cloud averaged over the whole domain" ;
        WCLDA:units = "m/s" ;
        WCLDA:missing_value = -9999.f ;
float WCOR(time, z) ;
        WCOR:long_name = "Mean W in core" ;
        WCOR:units = "m/s" ;
        WCOR:missing_value = -9999.f ;
float WCORA(time, z) ;
        WCORA:long_name = "W in core averaged over the whole domain" ;
        WCORA:units = "m/s" ;
        WCORA:missing_value = -9999.f ;
float WENV(time, z) ;
        WENV:long_name = "Mean W in unsaturated environment" ;
        WENV:units = "m/s" ;
        WENV:missing_value = -9999.f ;
float WENVA(time, z) ;
        WENVA:long_name = "W in unsaturated environment averaged over the whole domain" ;
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        WENVA:units = “m/s” ;
        WENVA:missing_value = -9999.f ;
float WMAX(time) ;
        WMAX:long_name = “Maximum Updraft Velocity” ;
        WMAX:units = “m/s” ;
float WOBS(time, z) ;
        WOBS:long_name = “Observed large-scale vert. velocity” ;
        WOBS:units = “m/s” ;
        WOBS:missing_value = -9999.f ;
float WPGFCDN(time, z) ;
        WPGFCDN:long_name = “Vertical pressure gradient in downdraft core” ;
        WPGFCDN:units = “m/s2” ;
        WPGFCDN:missing_value = -9999.f ;
float WPGFCLD(time, z) ;
        WPGFCLD:long_name = “Vertical pressure gradient in cloud” ;
        WPGFCLD:units = “m/s2” ;
        WPGFCLD:missing_value = -9999.f ;
float WPGFCOR(time, z) ;
        WPGFCOR:long_name = “Vertical pressure gradient in core” ;
        WPGFCOR:units = “m/s2” ;
        WPGFCOR:missing_value = -9999.f ;
float WPGFENV(time, z) ;
        WPGFENV:long_name = “Vertical pressure gradient in unsaturated environment” ;
        WPGFENV:units = “m/s2” ;
        WPGFENV:missing_value = -9999.f ;
float WPGFSDN(time, z) ;
        WPGFSDN:long_name = “Vertical pressure gradient in saturated downdrafts” ;
        WPGFSDN:units = “m/s2” ;
        WPGFSDN:missing_value = -9999.f ;
float WPGFSUP(time, z) ;
        WPGFSUP:long_name = “Vertical pressure gradient in saturated updrafts” ;
        WPGFSUP:units = “m/s2” ;
        WPGFSUP:missing_value = -9999.f ;
float WSDN(time, z) ;
        WSDN:long_name = “Mean W in saturated downdrafts” ;
        WSDN:units = “m/s” ;
        WSDN:missing_value = -9999.f ;
float WSDNA(time, z) ;
        WSDNA:long_name = “W in saturated downdrafts averaged over the whole domain” ;
        WSDNA:units = “m/s” ;
        WSDNA:missing_value = -9999.f ;
float WSKEW(time, z) ;
        WSKEW:long_name = “Vertical velocity skewness W3/(W2)^3/2” ;
        WSKEW:units = “” ;
        WSKEW:missing_value = -9999.f ;
float WSTAR3(time, z) ;
        WSTAR3:long_name = “Value at inversion is w*^3 (conv. vel. scale)” ;
        WSTAR3:units = “m3/s3” ;
        WSTAR3:missing_value = -9999.f ;
float WSUP(time, z) ;
        WSUP:long_name = “Mean W in saturated updrafts” ;
        WSUP:units = “m/s” ;
        WSUP:missing_value = -9999.f ;
float WSUPA(time, z) ;
        WSUPA:long_name = “W in saturated updrafts averaged over the whole domain” ;
        WSUPA:units = “m/s” ;
        WSUPA:missing_value = -9999.f ;
float WUADV(time, z) ;
        WUADV:long_name = “WU advection (Resolved)” ;
        WUADV:units = “m2/s3” ;
        WUADV:missing_value = -9999.f ;
float WUANIZ(time, z) ;
```

```
            WUANIZ:long_name = “WU return to anisotropy (Resolved)” ;
            WUANIZ:units = “m2/s3” ;
            WUANIZ:missing_value = -9999.f ;
float WUBUOY(time, z) ;
            WUBUOY:long_name = “WU buoyancy (Resolved)” ;
            WUBUOY:units = “m2/s3” ;
            WUBUOY:missing_value = -9999.f ;
float WUDIFF(time, z) ;
            WUDIFF:long_name = “WU diffusion (Resolved)” ;
            WUDIFF:units = “m2/s3” ;
            WUDIFF:missing_value = -9999.f ;
float WUPRES(time, z) ;
            WUPRES:long_name = “WU pressure (Resolved)” ;
            WUPRES:units = “m2/s3” ;
            WUPRES:missing_value = -9999.f ;
float WUSHEAR(time, z) ;
            WUSHEAR:long_name = “WU shear(Resolved)” ;
            WUSHEAR:units = “m2/s3” ;
            WUSHEAR:missing_value = -9999.f ;
float WVADV(time, z) ;
            WVADV:long_name = “WV advection (Resolved)” ;
            WVADV:units = “m2/s3” ;
            WVADV:missing_value = -9999.f ;
float WVANIZ(time, z) ;
            WVANIZ:long_name = “WV return to anisotropy (Resolved)” ;
            WVANIZ:units = “m2/s3” ;
            WVANIZ:missing_value = -9999.f ;
float WVBUOY(time, z) ;
            WVBUOY:long_name = “WV buoyancy (Resolved)” ;
            WVBUOY:units = “m2/s3” ;
            WVBUOY:missing_value = -9999.f ;
float WVDIFF(time, z) ;
            WVDIFF:long_name = “WV diffusion (Resolved)” ;
            WVDIFF:units = “m2/s3” ;
            WVDIFF:missing_value = -9999.f ;
float WVPRES(time, z) ;
            WVPRES:long_name = “WV pressure (Resolved)” ;
            WVPRES:units = “m2/s3” ;
            WVPRES:missing_value = -9999.f ;
float WVSHEAR(time, z) ;
            WVSHEAR:long_name = “WV shear (Resolved)” ;
            WVSHEAR:units = “m2/s3” ;
            WVSHEAR:missing_value = -9999.f ;
float ZCB(time) ;
            ZCB:long_name = “GCSS Mean Cloud-base Height” ;
            ZCB:units = “km” ;
            ZCB:_FillValue = -1.f ;
float ZCB2(time) ;
            ZCB2:long_name = “GCSS Variance of Cloud-base Height” ;
            ZCB2:units = “km” ;
            ZCB2:_FillValue = -1.f ;
float ZCBMIN(time) ;
            ZCBMIN:long_name = “GCSS Minimum Cloud-base Height” ;
            ZCBMIN:units = “km” ;
            ZCBMIN:_FillValue = -1.f ;
float ZCT(time) ;
            ZCT:long_name = “GCSS Mean Cloud-top Height” ;
            ZCT:units = “km” ;
            ZCT:_FillValue = -1.f ;
float ZCT2(time) ;
            ZCT2:long_name = “GCSS Variance of Cloud-top Height” ;
            ZCT2:units = “km2” ;
```

```
                ZCT2:_FillValue = -1.f ;
        float ZCTMAX(time) ;
                ZCTMAX:long_name = “GCSS Maximum Cloud-top Height” ;
                ZCTMAX:units = “km” ;
                ZCTMAX:_FillValue = -1.f ;
        float ZINV(time) ;
                ZINV:long_name = “GCSS Inversion Height” ;
                ZINV:units = “km” ;
                ZINV:_FillValue = -1.f ;
        float ZINV2(time) ;
                ZINV2:long_name = “GCSS Variance of the Inversion Height” ;
                ZINV2:units = “km2” ;
                ZINV2:_FillValue = -1.f ;
        float p(z) ;
                p:units = “mb” ;
                p:long_name = “pressure” ;
        float time(time) ;
                time:units = “day” ;
                time:long_name = “time” ;
        float z(z) ;
                z:units = “m” ;
                z:long_name = “height” ;

// global attributes:
                :SAM\ version = “nit” ;
                :caseid = “agu.varanal_ls_nouv.varanal_sf.varanal_i” ;
                :doi = “10.5439/1256454” ;
                :contacts = “LASSO PI: William Gustafson (William.Gustafson@pnnl.gov), LASSO Co-PI: Andrew Vogelmann
(vogelmann@bnl.gov)” ;
                :process_version = “Evaluation Version” ;
                :site_id = “sgp” ;
                :facility_id = “C1” ;
                :location_description = “Southern Great Plains (SGP), Lamont, Oklahoma” ;
                :simulation_id_number = 3 ;
                :model_type = “SAM” ;
                :model_version = “6.10.6” ;
                :output_domain_size = “25.6 km” ;
                :output_start_datetime = “20150606.120000 UTC” ;
                :config_forecast_time = “15 hours” ;
                :config_boundary_method = “periodic” ;
                :config_microphysics = “Morrison” ;
                :config_large_scale_forcing = “VARANAL” ;
                :config_large_scale_forcing_scale = “300 km” ;
                :config_large_scale_forcing_specifics = “VARANARAP LAND” ;
                :output_horizontal_grid_spacing = “100 m” ;
                :output_number_of_levels = “304 levels” ;
                :config_surface_treatment = “VARANAL” ;
                :config_surface_treatment_specifics = “VARANARAP LAND” ;
                :config_initial_condition = “VARANAL” ;
                :config_initial_condition_specifics = “VARANARAP LAND” ;
                :config_aerosol = “constant” ;
                :config_comments = “AGU” ;
                :config_nickname = “sgp20150606/agu.varanal_ls.varanal_sf.varanal_init” ;
                :history = “Wed Jun 29 23:43:18 2016: ncks -O --fl_fmt=netcdf4 --deflate=2 /lustre/atlas1/cli120/proj-shared/
d3m088/alpha1release/lasso-alpha1_release/sgplassodiagobsmodC1.c1/20150606/sim0003/raw_model/sgp20150606_agu.varan-
al_ls.varanal_sf.varanal_init.nc /lustre/atlas1/cli120/proj-shared/d3m088/alpha1release/lasso-alpha1_release/sgplassodiagobsmodC1.
c1/20150606/sim0003/raw_model/sgp20150606_agu.varanal_ls.varanal_sf.varanal_init.nc” ;
                :NCO = “4.3.9” ;
}
```

File: .../20150606/sim0003/raw_model/gp20150606_agu.varanal_ls.varanal_sf.varanal_init_256.2Dcom_1.nc

Description: 2-D (X-Y) SAM output averaged between output times. The time label represents the middle of the averaging period.

```
netcdf sgp20150606_agu.varanal_ls.varanal_sf.varanal_init_256.2Dcom_1 {
dimensions:
        time = UNLIMITED ; // (60 currently)
        y = 256 ;
        x = 256 ;
variables:
        float CLD(time, y, x) ;
                CLD:long_name = “Cloud Frequency” ;
                CLD:units = “%” ;
        float CWP(time, y, x) ;
                CWP:long_name = “Cloud Water Path” ;
                CWP:units = “mm” ;
        float IWP(time, y, x) ;
                IWP:long_name = “Ice Path” ;
                IWP:units = “mm” ;
        float LWNS(time, y, x) ;
                LWNS:long_name = “Net LW at the surface” ;
                LWNS:units = “W/m2” ;
        float LWNSC(time, y, x) ;
                LWNSC:long_name = “Net clear-sky LW at the surface” ;
                LWNSC:units = “W/m2” ;
        float LWNT(time, y, x) ;
                LWNT:long_name = “Net LW at TOA” ;
                LWNT:units = “W/m2” ;
        float LWNTC(time, y, x) ;
                LWNTC:long_name = “Clear-Sky Net LW at TOA” ;
                LWNTC:units = “W/m2” ;
        float PSFC(time, y, x) ;
                PSFC:long_name = “P at the surface” ;
                PSFC:units = “mbar” ;
        float PW(time, y, x) ;
                PW:long_name = “Precipitable Water” ;
                PW:units = “mm” ;
        float Prec(time, y, x) ;
                Prec:long_name = “Surface Precip. Rate” ;
                Prec:units = “mm/day” ;
        float SOLIN(time, y, x) ;
                SOLIN:long_name = “Solar TOA insolation” ;
                SOLIN:units = “W/m2” ;
        float SWNS(time, y, x) ;
                SWNS:long_name = “Net SW at the surface” ;
                SWNS:units = “W/m2” ;
        float SWNSC(time, y, x) ;
                SWNSC:long_name = “Net Clear-sky SW at the surface” ;
                SWNSC:units = “W/m2” ;
        float SWNT(time, y, x) ;
                SWNT:long_name = “Net SW at TOA” ;
                SWNT:units = “W/m2” ;
        float SWNTC(time, y, x) ;
                SWNTC:long_name = “Net Clear-Sky SW at TOA” ;
                SWNTC:units = “W/m2” ;
        float SWVP(time, y, x) ;
                SWVP:long_name = “Saturated Water Vapor Path” ;
                SWVP:units = “mm” ;
        float TB(time, y, x) ;
```

```
                TB:long_name = “Cloud top temperature (Instantaneous)” ;
                TB:units = “K” ;
        float U200(time, y, x) ;
                U200:long_name = “U at 200 mb” ;
                U200:units = “m/s” ;
        float U850(time, y, x) ;
                U850:long_name = “850 mbar zonal velocity” ;
                U850:units = “m/s” ;
        float USFC(time, y, x) ;
                USFC:long_name = “U at the surface” ;
                USFC:units = “m/s” ;
        float V200(time, y, x) ;
                V200:long_name = “V at 200 mb” ;
                V200:units = “m/s” ;
        float V850(time, y, x) ;
                V850:long_name = “850 mbar meridional velocity” ;
                V850:units = “m/s” ;
        float VSFC(time, y, x) ;
                VSFC:long_name = “V at the surface” ;
                VSFC:units = “m/s” ;
        float W500(time, y, x) ;
                W500:long_name = “W at 500 mb” ;
                W500:units = “m/s” ;
        float ZC(time, y, x) ;
                ZC:long_name = “Cloud top height (Instantaneous)” ;
                ZC:units = “km” ;
        float ZE(time, y, x) ;
                ZE:long_name = “Echo top height (Instantaneous)” ;
                ZE:units = “km” ;
        float time(time) ;
                time:units = “day” ;
                time:long_name = “time” ;
        float x(x) ;
                x:units = “m” ;
        float y(y) ;
                y:units = “m” ;

// global attributes:
                :doi = “10.5439/1256454” ;
                :contacts = “LASSO PI: William Gustafson (William.Gustafson@pnnl.gov), LASSO Co-PI: Andrew Vogelmann
(vogelmann@bnl.gov)” ;
                :process_version = “Evaluation Version” ;
                :site_id = “sgp” ;
                :facility_id = “C1” ;
                :location_description = “Southern Great Plains (SGP), Lamont, Oklahoma” ;
                :simulation_id_number = 3 ;
                :model_type = “SAM” ;
                :model_version = “6.10.6” ;
                :output_domain_size = “25.6 km” ;
                :output_start_datetime = “20150606.120000 UTC” ;
                :config_forecast_time = “15 hours” ;
                :config_boundary_method = “periodic” ;
                :config_microphysics = “Morrison” ;
                :config_large_scale_forcing = “VARANAL” ;
                :config_large_scale_forcing_scale = “300 km” ;
                :config_large_scale_forcing_specifics = “VARANARAP LAND” ;
                :output_horizontal_grid_spacing = “100 m” ;
                :output_number_of_levels = “304 levels” ;
                :config_surface_treatment = “VARANAL” ;
                :config_surface_treatment_specifics = “VARANARAP LAND” ;
                :config_initial_condition = “VARANAL” ;
                :config_initial_condition_specifics = “VARANARAP LAND” ;
```

```
                :config_aerosol = "constant" ;
                :config_comments = "AGU" ;
                :config_nickname = "sgp20150606/agu.varanal_ls.varanal_sf.varanal_init" ;
                :history = "Wed Jun 29 23:46:28 2016: ncks -O --fl_fmt=netcdf4 --deflate=2 /lustre/atlas1/cli120/proj-shared/
d3m088/alpha1release/lasso-alpha1_release/sgplassodiagobsmodC1.c1/20150606/sim0003/raw_model/sgp20150606_agu.varanal_ls.
varanal_sf.varanal_init_256.2Dcom_1.nc /lustre/atlas1/cli120/proj-shared/d3m088/alpha1release/lasso-alpha1_release/sgplassodiagob-
smodC1.c1/20150606/sim0003/raw_model/sgp20150606_agu.varanal_ls.varanal_sf.varanal_init_256.2Dcom_1.nc" ;
                :NCO = "4.3.9" ;
}
```

File: .../20150606/sim0003/raw_model/sgp20150606_agu.varanal_ls.varanal_sf.varanal_init_256_0000001800.nc

Description: Instantaneous 3-D (X-Y-Z) SAM output.

```
netcdf sgp20150606_agu.varanal_ls.varanal_sf.varanal_init_256_0000001800 {
dimensions:
        time = UNLIMITED ; // (1 currently)
        z = 337 ;
        y = 256 ;
        x = 256 ;
variables:
        float NC(time, z, y, x) ;
                NC:long_name = "CLOUD WATER NUMBER CONCENTRATION                                    " ;
                NC:units = "#/cm3     " ;
        float NG(time, z, y, x) ;
                NG:long_name = "GRAUPEL NUMBER CONCENTRATION                                    " ;
                NG:units = "#/cm3     " ;
        float NI(time, z, y, x) ;
                NI:long_name = "CLOUD ICE NUMBER CONCENTRATION                                    " ;
                NI:units = "#/cm3     " ;
        float NR(time, z, y, x) ;
                NR:long_name = "RAIN NUMBER CONCENTRATION                                    " ;
                NR:units = "#/cm3     " ;
        float NS(time, z, y, x) ;
                NS:long_name = "SNOW NUMBER CONCENTRATION                                    " ;
                NS:units = "#/cm3     " ;
        float PP(time, z, y, x) ;
                PP:long_name = "Pressure Perturbation                                    " ;
                PP:units = "Pa        " ;
        float QG(time, z, y, x) ;
                QG:long_name = "GRAUPEL                                    " ;
                QG:units = "g/kg      " ;
        float QI(time, z, y, x) ;
                QI:long_name = "CLOUD ICE                                    " ;
                QI:units = "g/kg      " ;
        float QN(time, z, y, x) ;
                QN:long_name = "Non-precipitating Condensate (Water+Ice)                                    " ;
                QN:units = "g/kg      " ;
        float QP(time, z, y, x) ;
                QP:long_name = "Precipitating Water (Rain+Snow)                                    " ;
                QP:units = "g/kg      " ;
        float QR(time, z, y, x) ;
                QR:long_name = "RAIN                                    " ;
                QR:units = "g/kg      " ;
        float QRAD(time, z, y, x) ;
                QRAD:long_name = "Radiative heating rate                                    " ;
                QRAD:units = "K/day     " ;
        float QS(time, z, y, x) ;
                QS:long_name = "SNOW                                    " ;
                QS:units = "g/kg      " ;
```

```
        float QV(time, z, y, x) ;
                QV:long_name = "Water Vapor                                    " ;
                QV:units = "g/kg      " ;
        float TABS(time, z, y, x) ;
                TABS:long_name = "Absolute Temperature                          " ;
                TABS:units = "K         " ;
        float U(time, z, y, x) ;
                U:long_name = "X Wind Component                                 " ;
                U:units = "m/s       " ;
        float V(time, z, y, x) ;
                V:long_name = "Y Wind Component                                 " ;
                V:units = "m/s       " ;
        float W(time, z, y, x) ;
                W:long_name = "Z Wind Component                                 " ;
                W:units = "m/s       " ;
        float p(z) ;
                p:units = "mb" ;
                p:long_name = "pressure" ;
        float time(time) ;
                time:units = "d" ;
                time:long_name = "time" ;
        float x(x) ;
                x:units = "m" ;
        float y(y) ;
                y:units = "m" ;
        float z(z) ;
                z:units = "m" ;
                z:long_name = "height" ;

// global attributes:
                :doi = "10.5439/1256454" ;
                :contacts = "LASSO PI: William Gustafson (William.Gustafson@pnnl.gov), LASSO Co-PI: Andrew Vogelmann
(vogelmann@bnl.gov)" ;
                :process_version = "Evaluation Version" ;
                :site_id = "sgp" ;
                :facility_id = "C1" ;
                :location_description = "Southern Great Plains (SGP), Lamont, Oklahoma" ;
                :simulation_id_number = 3 ;
                :model_type = "SAM" ;
                :model_version = "6.10.6" ;
                :output_domain_size = "25.6 km" ;
                :output_start_datetime = "20150606.120000 UTC" ;
                :config_forecast_time = "15 hours" ;
                :config_boundary_method = "periodic" ;
                :config_microphysics = "Morrison" ;
                :config_large_scale_forcing = "VARANAL" ;
                :config_large_scale_forcing_scale = "300 km" ;
                :config_large_scale_forcing_specifics = "VARANARAP LAND" ;
                :output_horizontal_grid_spacing = "100 m" ;
                :output_number_of_levels = "304 levels" ;
                :config_surface_treatment = "VARANAL" ;
                :config_surface_treatment_specifics = "VARANARAP LAND" ;
                :config_initial_condition = "VARANAL" ;
                :config_initial_condition_specifics = "VARANARAP LAND" ;
                :config_aerosol = "constant" ;
                :config_comments = "AGU" ;
                :config_nickname = "sgp20150606/agu.varanal_ls.varanal_sf.varanal_init" ;
                :history = "Wed Jun 29 23:44:10 2016: ncks -O --fl_fmt=netcdf4 --deflate=2 /lustre/atlas1/cli120/proj-shared/
d3m088/alpha1release/lasso-alpha1_release/sgplassodiagobsmodC1.c1/20150606/sim0003/raw_model/sgp20150606_agu.varanal_ls.
varanal_sf.varanal_init_256_0000001800.nc /lustre/atlas1/cli120/proj-shared/d3m088/alpha1release/lasso-alpha1_release/sgplassodi-
agobsmodC1.c1/20150606/sim0003/raw_model/sgp20150606_agu.varanal_ls.varanal_sf.varanal_init_256_0000001800.nc" ;
                :NCO = "4.3.9" ;
```

}