

CSU – RAMS

REVU Post-Processing Package Model Variable Listing & Diagnostic Process Budget Variables

This document contains a list of output variables that can be specified in the REVU post-processing namelist “REVU_IN” for output in ASCII and HDF5 format. This provides an ASCII-ID, the variable string to input in REVU_IN, and a description of the variable with units. Also provided is a current list and description of available diagnostic process budget variables in which most are microphysical budgets.

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Last updated: 5 August, 2021

RAMS OUTPUT VARIABLES:

ASCII ID: REVU INPUT NAME: Description with units:

DEFAULT EMPTY VARIABLES USED AS PLACE HOLDERS – 1 variables
EMT3 empty3d nothing here – all zeros

AEROSOL AOD 2D

These are generated after running RAMS output through “AOD-Python” post-processing code. Requires inputting ALL simulation vertical levels into “AOD-Python” and reformatting RAMS “head” files for these new variables. Bash scripts are available for generating AOD. AOD at 550nm is default.

| | | |
|------|-------------------------|--------------------------------------|
| ACND | ccn_dry_AOD_550 | CCN AOD(dry aerosol value) |
| ACNW | ccn_wet_AOD_550 | CCN AOD(hydrated, RH mask) |
| AD1D | dust1_dry_AOD_550 | Dust-1 AOD(dry aerosol value) |
| AD1W | dust1_wet_AOD_550 | Dust-1 AOD(hydrated, RH mask) |
| AD2D | dust2_dry_AOD_550 | Dust-2 AOD(dry aerosol value) |
| AD2W | dust2_wet_AOD_550 | Dust-2 AOD(hydrated, RH mask) |
| AR1D | regen_aerol_dry_AOD_550 | Regenerated-1 AOD(dry aerosol value) |
| AR1W | regen_aerol_wet_AOD_550 | Regenerated-1 AOD(hydrated, RH mask) |
| AR2D | regen_aero2_dry_AOD_550 | Regenerated-2 AOD(dry aerosol value) |
| AR2W | regen_aero2_wet_AOD_550 | Regenerated-2 AOD(hydrated, RH mask) |
| ASFD | salt_film_dry_AOD_550 | Salt-film AOD(dry aerosol value) |
| ASFW | salt_film_wet_AOD_550 | Salt-film AOD(hydrated, RH mask) |
| ASJD | salt_jet_dry_AOD_550 | Salt-jet AOD(dry aerosol value) |
| ASJW | salt_jet_wet_AOD_550 | Salt-jet AOD(hydrated, RH mask) |
| ASSD | salt_spume_dry_AOD_550 | Salt-spume AOD(dry aerosol value) |
| ASSW | salt_spume_wet_AOD_550 | Salt-spume AOD(hydrated, RH mask) |
| ATOD | Total_dry_AOD_550 | Sum Total AOD(dry aerosol value) |
| ATOW | Total_wet_AOD_550 | Sum Total AOD(hydrated, RH mask) |

AEROSOL EXTINCTION COEFFICIENT 3D

Same as aerosol AOD from AOD-Python code, except for extinction coeff.

| | | |
|------|-------------------------|------------------------------------|
| ECND | ccn_dry_ext_550 | CCN dry extinction(1/Mm) |
| ECNW | ccn_wet_ext_550 | CCN wet extinction(1/Mm) |
| ED1D | dust1_dry_ext_550 | Dust-1 dry extinction(1/Mm) |
| ED1W | dust1_wet_ext_550 | Dust-1 wet extinction(1/Mm) |
| ED2D | dust2_dry_ext_550 | Dust-2 dry extinction(1/Mm) |
| ED2W | dust2_wet_ext_550 | Dust-2 wet extinction(1/Mm) |
| ER1D | regen_aerol_dry_ext_550 | Regenerated-1 dry extinction(1/Mm) |
| ER1W | regen_aerol_wet_ext_550 | Regenerated-1 wet extinction(1/Mm) |
| ER2D | regen_aero2_dry_ext_550 | Regenerated-2 dry extinction(1/Mm) |
| ER2W | regen_aero2_wet_ext_550 | Regenerated-2 wet extinction(1/Mm) |
| ESFD | salt_film_dry_ext_550 | Salt-film dry extinction(1/Mm) |
| ESFW | salt_film_wet_ext_550 | Salt-film wet extinction(1/Mm) |
| ESJD | salt_jet_dry_ext_550 | Salt-jet dry extinction(1/Mm) |
| ESJW | salt_jet_wet_ext_550 | Salt-jet wet extinction(1/Mm) |
| ESSD | salt_spume_dry_ext_550 | Salt-spume dry extinction(1/Mm) |
| ESSW | salt_spume_wet_ext_550 | Salt-spume wet extinction(1/Mm) |
| ETOD | Total_dry_ext_550 | Sum Total dry extinction(1/Mm) |
| ETOW | Total_wet_ext_550 | Sum Total wet extinction(1/Mm) |

3D VELOCITY AND VORTICITY VARIABLES

| | | |
|------|-------|------------|
| UWND | u | u(m/s) |
| VWND | v | v(m/s) |
| UWDA | u_avg | u_avg(m/s) |
| VWDA | v_avg | v_avg(m/s) |
| UEWD | ue | ue(m/s) |

| | | |
|------|-----------|------------------------------|
| VEWD | ve | ve(m/s) |
| UEWA | ue_avg | ue_avg(m/s) |
| VEWA | ve_avg | ve_avg(m/s) |
| WWND | w | w(m/s) |
| WCMS | wcms | w(cm/s) |
| WAVG | w_avg | w_avg(m/s) |
| SPED | speed | speed(m/s) |
| SMPH | speed_mph | speed(mph) |
| SP10 | speed10m | speed-10m-AGL(m/s) |
| DRCT | direction | direction(deg) |
| XVOR | relvortx | x-vorticity(rad/s) |
| YVOR | relvorty | y-vorticity(rad/s) |
| ZVOR | relvortz | relative-z-vorticity(rad/s) |
| AVOR | absvortz | absolute-z-vorticity(rad/s) |
| PVOR | potvortz | potential-z-vorticity(rad/s) |
| HDIV | horiz_div | horizontal-divergence(/s) |

3D THERMODYNAMIC PROPERTIES OF AIR

| | | |
|-------|-----------------|-------------------------------------|
| XNER | pi | Exner-func(J/kg*K) |
| PRES | press | pressure(mb) |
| PPRM | pprime | mslp-perturbation(mb) |
| THIL | theta_il | ice-liquid-potential-temp(K) |
| THTA | theta | potential-temperature(K) |
| DEN0 | dn0 | reference-density(kg/m3) |
| XNR0 | pi0 | reference-Exner-function(J/kg*K) |
| THV0 | th0 | reference-virtual-potential-temp(K) |
| PERT | pert_pressure | perturbation-pressure(mb) |
| TMPK | tempk | temperature(K) |
| TMPC | tempc | temperature(C) |
| TMPF | tempf | temperature(F) |
| THTE | theta_e | equivalent-potential-temp(K) |
| THTV | theta_v | virtual-potential-temp(K) |
| THTR | theta_rho | density-potential-temp(K) |
| BOYL | buoyancy_liquid | buoyancy-liquid(m/s2) |
| TMPF2 | tempf2m | temp-2m-AGL(F) |
| TMPC2 | tempc2m | temp-2m-AGL(C) |

3D HYDROMETEOR GAMMA DISTRIBUTION INFO

| | | |
|------|----------------|---|
| CGDM | cloud_gam_dm | cloud mass-weighted-mean-diam(mm) |
| CGD0 | cloud_gam_d0 | cloud volumetric-mean-diam(mm) |
| RGDM | rain_gam_dm | rain mass-weighted-mean-diam(mm) |
| RGD0 | rain_gam_d0 | rain volumetric-mean-diam(mm) |
| RGNW | rain_gam_lognw | rain normalized-intercept(1/mm x 1/m3) |
| RGSG | rain_gam_sigma | rain mass-spectrum-stdv(mm) |
| SGDM | snow_gam_dm | snow mass-weighted-mean-diam(mm) |
| SGD0 | snow_gam_d0 | snow volumetric-mean-diam (mm) |
| SGNW | snow_gam_lognw | snow normalized-intercept(1/mm x 1/m3) |
| SGSG | snow_gam_sigma | snow mass-spectrum-stdv(mm) |
| AGDM | aggr_gam_dm | aggregate mass-weighted-mean-diam(mm) |
| AGD0 | aggr_gam_d0 | aggregate volumetric-mean-diam(mm) |
| AGNW | aggr_gam_lognw | aggregate normalized-intercept(1/mm x 1/m3) |
| AGSG | aggr_gam_sigma | aggregate mass-spectrum-stdv(mm) |
| GGDM | grau_gam_dm | graupel mass-weighted-mean-diam(mm) |
| GGD0 | grau_gam_d0 | graupel volumetric-mean-diam(mm) |
| GGNW | grau_gam_lognw | graupel normalized-intercept(1/mm x 1/m3) |
| GGSG | grau_gam_sigma | graupel mass-spectrum-stdv(mm) |
| HGDM | hail_gam_dm | hail mass-weighted-mean-diam(mm) |
| HGD0 | hail_gam_d0 | hail volumetric-mean-diam(mm) |

| | | |
|------|----------------|--|
| HGNW | hail_gam_lognw | hail normalized-intercept(1/mm x 1/m3) |
| HGSg | hail_gam_sigma | hail mass-spectrum-stdv(mm) |

3D MOISTURE MASS MIXING RATIOS AND HUMIDITY

| | | |
|------|--------------------|-------------------------------------|
| VPRS | vapr_press | vapor-pressure(mb) |
| RSLF | rslf | liquid-supersat-mixing-ratio(g/kg) |
| RSIF | rsif | ice-supersat-mixing-ratio(g/kg) |
| VMIX | vapor | vapor-mixing-ratio(g/kg) |
| CMIX | cloud | cloud-mixing-ratio(g/kg) |
| CMXV | cloud_m3 | cloud-mixing-ratio(g/m3) |
| RMIX | rain | rain-mixing-ratio(g/kg) |
| RMXV | rain_m3 | rain-mixing-ratio(g/m3) |
| PMIX | pristine | pristine-mixing-ratio(g/kg) |
| PMXV | pristine_m3 | pristine-mixing-ratio(g/m3) |
| SMIX | snow | snow-mixing-ratio(g/kg) |
| SMXV | snow_m3 | snow-mixing-ratio(g/m3) |
| AMIX | aggregates | aggregate-mixing-ratio(g/kg) |
| AMXV | aggregates_m3 | aggregate-mixing-ratio(g/m3) |
| GMIX | graupel | graupel-mixing-ratio(g/kg) |
| GMXV | graupel_m3 | graupel-mixing-ratio(g/m3) |
| HMIX | hail | hail-mixing-ratio(g/kg) |
| HMXV | hail_m3 | hail-mixing-ratio(g/m3) |
| DMIX | drizzle | drizzle-mixing-ratio(g/kg) |
| DMXV | drizzle_m3 | drizzle-mixing-ratio(g/m3) |
| PSAM | prissnowagg | snowprisagg-mixing-ratio(g/kg) |
| GHEM | grauphail | grauphail-mixing-ratio(g/kg) |
| LMIX | liquid | liquid-mixing-ratio(g/kg) |
| IMIX | ice | ice-mixing-ratio(g/kg) |
| TMIX | total_cond | total-condensate-mixing-ratio(g/kg) |
| TMXV | total_cond_m3 | total-condensate-mixing-ratio(g/m3) |
| MIXR | total_mixr | total-water-mixing-ratio-RTP(g/kg) |
| MIXR | total_mixr | total-water-mixing-ratio-RTP(g/m3) |
| CTST | ctop_tempc_sstbase | cloud-top-temperature(C) |
| CTOP | ctop_tempc_nobase | cloud-top-temperature(C) |
| DWPK | dewptk | dewpoint-temperature(K) |
| DWPF | dewptf | dewpoint-temperature(F) |
| DWPC | dewptc | dewpoint-temperature(C) |
| RELH | relhum | relative-humidity(%) |
| RHFR | relhum_frac | relative-humidity(fraction) |
| CLRF | clear_frac | clear-sky(fraction) |
| CLDF | cloud_frac | cloud-cover(fraction) |

3D HYDROMETEOR NUMBER CONCENTRATIONS

| | | |
|------|-------------------|------------------------|
| CNMG | cloud_concen_mg | cloud-concen(#/mg) |
| CNKG | cloud_concen_kg | cloud-concen(#/kg) |
| RNKG | rain_concen_kg | rain-concen(#/kg) |
| PNMG | pris_concen_mg | pristine-concen(#/mg) |
| PNKG | pris_concen_kg | pristine-concen(#/kg) |
| SNKG | snow_concen_kg | snow-concen(#/kg) |
| ANKG | agg_concen_kg | aggregate-concen(#/kg) |
| GNKG | graup_concen_kg | graupel-concen(#/kg) |
| HNKG | hail_concen_kg | hail-concen(#/kg) |
| DNMG | drizzle_concen_mg | drizzle-concen(#/mg) |
| DNKG | drizzle_concen_kg | drizzle-concen(#/kg) |
| CNC3 | cloud_concen_cm3 | cloud-concen(#/cm3) |
| RNM3 | rain_concen_m3 | rain-concen(#/m3) |
| RND3 | rain_concen_dm3 | rain-concen(#/dm3) |
| PNM3 | pris_concen_m3 | pristine-concen(#/m3) |

| | | |
|------|--------------------|------------------------|
| PNC3 | pris_concen_cm3 | pristine-concen(#/cm3) |
| SNM3 | snow_concen_m3 | snow-concen(#/m3) |
| SNC3 | snow_concen_cm3 | snow-concen(#/cm3) |
| ANM3 | agg_concen_m3 | aggregate-concen(#/m3) |
| GNM3 | graup_concen_m3 | graupel-concen(#/m3) |
| HNM3 | hail_concen_m3 | hail-concen(#/m3) |
| DNC3 | drizzle_concen_cm3 | drizzle-concen(#/cm3) |

HUCM-SBM SPECIFIC MICROPHYSICS

| | | |
|------|---------------------|------------------------------------|
| IPMX | ice_plates | plates-mixing-ratio(g/kg) |
| ICMX | ice_columns | columns-mixing-ratio(g/kg) |
| IDMX | ice_dendrites | dendrites-mixing-ratio(g/kg) |
| PCMG | plates_concen_mg | plates-concen(#/mg) |
| PCKG | plates_concen_kg | plates-concen(#/kg) |
| CCMG | columns_concen_mg | columns-concen(#/mg) |
| CCKG | columns_concen_kg | columns-concen(#/kg) |
| DCMG | dendrites_concen_mg | dendrites-concen(#/mg) |
| DCKG | dendrites_concen_kg | dendrites-concen(#/kg) |
| PVIP | pcpvip | 3D-iceplates-precip-rate(mm/hr) |
| PVIC | pcpvic | 3D-icecolumns-precip-rate(mm/hr) |
| PVID | pcpvid | 3D-icedendrites-precip-rate(mm/hr) |
| PRIP | pcprp | iceplates-precip-rate(mm/hr) |
| PRIC | pcpric | icecolumns-precip-rate(mm/hr) |
| PRID | pcprid | icedendrites-precip-rate(mm/hr) |
| ACIP | accpip | accum-iceplates(kg/m2) |
| ACIC | accpic | accum-icecolumns(kg/m2) |
| ACID | accpid | accum-icedendrites(kg/m2) |

3D AEROSOLS NUMBER, MASS, SIZE, SOLUBILITY

| | | |
|-------|--------------------|--|
| IFNM | ifn_concen_mg | ice-nuclei-concentration(#/mg) |
| IFNC | ifn_concen_cm3 | ice-nuclei-concentration(#/cm3) |
| CCNM | ccn_concen_mg | ccn-concentration(#/mg) |
| CCNC | ccn_concen_cm3 | ccn-concentration(#/cm3) |
| GCNM | gccn_concen_mg | gccn-concentration(#/mg) |
| GCNC | gccn_concen_cm3 | gccn-concentration(#/cm3) |
| D1CN | dust1_concen | dust1-concentration(#/cm3) |
| D2CN | dust2_concen | dust2-concentration(#/cm3) |
| AC1CN | abs_carbon1_concen | absorbing-carbon1-concentration(#/cm3) |
| AC2CN | abs_carbon2_concen | absorbing-carbon2-concentration(#/cm3) |
| SFCN | salt_film_concen | salt-film-concentration(#/cm3) |
| SJCN | salt_jet_concen | salt-jet-concentration(#/cm3) |
| SSCN | salt_spume_concen | salt-spume-concentration(#/cm3) |
| R1CN | regen_aero1_concen | regenerated-aero1-concentration(#/cm3) |
| R2CN | regen_aero2_concen | regenerated-aero2-concentration(#/cm3) |
| CCCM | ccn_mass | ccn-mass(um-grams/m3) |
| GCCM | gccn_mass | gccn-mass(um-grams/m3) |
| D1CM | dust1_mass | dust1-mass(um-grams/m3) |
| D1CM | dust1_massd10 | dust1-mass(um-grams/m3/10) |
| D2CM | dust2_mass | dust2-mass(um-grams/m3) |
| D2CM | dust2_massd10 | dust2-mass(um-grams/m3/10) |
| AC1CM | abs_carbon1_mass | absorbing-carbon1-mass(um-grams/m3) |
| AC2CM | abs_carbon2_mass | absorbing-carbon2-mass(um-grams/m3) |
| SFCM | salt_film_mass | salt-film-mass(um-grams/m3) |
| SJCM | salt_jet_mass | salt-jet-mass(um-grams/m3) |
| SSCM | salt_spume_mass | salt-spume-mass(um-grams/m3) |
| R1CM | regen_aero1_mass | regenerated-aero1-mass(um-grams/m3) |
| R2CM | regen_aero2_mass | regenerated-aero2-mass(um-grams/m3) |
| R1SO | resol_aero1_mass | regen-soluble-aero1-mass(um-grams/m3) |

| | | |
|------|--------------------|---------------------------------------|
| R2SO | resol_aero2_mass | regen-soluble-aero2-mass(um-grams/m3) |
| R1EP | regen1_epsilon | regen1-solubility-fraction(fraction) |
| R2EP | regen2_epsilon | regen2-solubility-fraction(fraction) |
| CCCR | ccn_medrad | ccn-median-radius(um) |
| GCCR | gccn_medrad | gccn-median-radius(um) |
| D1CR | dust1_medrad | dust1-median-radius(um) |
| D2CR | dust2_medrad | dust2-median-radius(um) |
| SFCR | salt_film_medrad | salt-film-median-radius(um) |
| SJCR | salt_jet_medrad | salt-jet-median-radius(um) |
| SSCR | salt_spume_medrad | salt-spume-median-radius(um) |
| R1CR | regen_aerol_medrad | regenerated-aerol-median-radius(um) |
| R2CR | regen_aero2_medrad | regenerated-aero2-median-radius(um) |

3D AEROSOL TRACKING VARIABLES

| | | |
|------|--------------------|---|
| ARMC | aerosol_cloud_mass | aerosol-mass-in-cloud-drop(um-grams/m3) |
| ARMR | aerosol_rain_mass | aerosol-mass-in-rain-drop(um-grams/m3) |
| ARMP | aerosol_pris_mass | aerosol-mass-in-prisice(um-grams/m3) |
| ARMS | aerosol_snow_mass | aerosol-mass-in-snow(um-grams/m3) |
| ARMA | aerosol_aggr_mass | aerosol-mass-in-aggregates(um-grams/m3) |
| ARMG | aerosol_grau_mass | aerosol-mass-in-graupel(um-grams/m3) |
| ARMH | aerosol_hail_mass | aerosol-mass-in-hail(um-grams/m3) |
| ARMD | aerosol_driz_mass | aerosol-mass-in-drizzle(um-grams/m3) |
| ARHY | aerosol_hydro_mass | aerosol-mass-in-hydromets(um-grams/m3) |
| SLMC | soluble_cloud_mass | soluble-mass-in-cloud-drop(um-grams/m3) |
| SLMR | soluble_rain_mass | soluble-mass-in-rain-drop(um-grams/m3) |
| SLMP | soluble_pris_mass | soluble-mass-in-prisice(um-grams/m3) |
| SLMS | soluble_snow_mass | soluble-mass-in-snow(um-grams/m3) |
| SLMA | soluble_aggr_mass | soluble-mass-in-aggregates(um-grams/m3) |
| SLMG | soluble_grau_mass | soluble-mass-in-graupel(um-grams/m3) |
| SLMH | soluble_hail_mass | soluble-mass-in-hail(um-grams/m3) |
| SLMD | soluble_driz_mass | soluble-mass-in-drizzle(um-grams/m3) |
| SLHY | soluble_hydro_mass | soluble-mass-in-hydromets(um-grams/m3) |
| EPSI | aero_epsilon | solubility-fraction(fraction) |
| DUMC | dust_cloud_mass | dust-mass-in-cloud-drops(um-grams/m3) |
| DUMR | dust_rain_mass | dust-mass-in-rain-drops(um-grams/m3) |
| DUMP | dust_pris_mass | dust-mass-in-pristineice(um-grams/m3) |
| DUMS | dust_snow_mass | dust-mass-in-snow(um-grams/m3) |
| DUMA | dust_aggr_mass | dust-mass-in-aggregates(um-grams/m3) |
| DUMG | dust_grau_mass | dust-mass-in-graupel(um-grams/m3) |
| DUMH | dust_hail_mass | dust-mass-in-hail(um-grams/m3) |
| DUMD | dust_driz_mass | dust-mass-in-drizzle(um-grams/m3) |
| DUHY | dust_hydro_mass | dust-mass-in-hydrometeors(um-grams/m3) |
| DINC | dustifn_cloud_mass | dust-mass-in-cloud-drops(um-grams/m3) |
| DINR | dustifn_rain_mass | dustifn-mass-in-rain-drops(um-grams/m3) |
| DINP | dustifn_pris_mass | dustifn-mass-in-prisice(um-grams/m3) |
| DINS | dustifn_snow_mass | dustifn-mass-in-snow(um-grams/m3) |
| DINA | dustifn_aggr_mass | dustifn-mass-in-aggregates(um-grams/m3) |
| DING | dustifn_grau_mass | dustifn-mass-in-graupel(um-grams/m3) |
| DINH | dustifn_hail_mass | dustifn-mass-in-hail(um-grams/m3) |
| DIND | dustifn_driz_mass | dustifn-mass-in-drizzle(um-grams/m3) |
| DIHY | dustifn_hydro_mass | dustifn-mass-in-hydromets(um-grams/m3) |
| INTR | ifn_nuc_numtrack | IFN-already-nucleated-DeMott(#/cm3) |
| CICN | ifn_incloud | IFN-within-cloud-DeMott(#/cm3) |
| DICN | ifn_indriz | IFN-within-drizzle-DeMott(#/cm3) |
| RICN | ifn_inrain | IFN-within-rain-DeMott(#/cm3) |

3D VERTICAL VELOCITY AND MICROPHYSICAL INSTANTANEOUS BUDGETS – 15 variables

| | | |
|------|------------|----------------------------|
| WPAD | wp_advdiff | W-advection-diffusion(m/s) |
|------|------------|----------------------------|

| | | |
|------|---------------|---|
| WPTH | wp_buoy_theta | W-theta-buoyancy(m/s) |
| WPCD | wp_buoy_cond | W-theta-cond(m/s) |
| LHVP | latheatvap | Lat-Heat-Vap-dTheta-inst(dTheta) |
| LHFZ | latheatfrz | Lat-Heat-Frz-dTheta-inst(dTheta) |
| NUCR | nuccldr | Cloud-Nucleate-Mixing-Ratio-inst(g/kg) |
| CL2R | cld2rain | Cloud-to-rain-water-inst(g/kg) |
| IC2R | ice2rain | Ice-to-rain-water-inst(g/kg) |
| NUIR | nucicer | Ice-Nucleated-Mixing-Ratio-inst(g/kg) |
| VAPL | vapliq | Liq-Vapor-diff-evap-MixRatio-inst(g/kg) |
| VAPI | vapice | Ice-Vapor-diff-evap-MixRatio-inst(g/kg) |
| MELT | meltice | Melting-of-ice-inst(g/kg) |
| RIMC | rimecld | Rimed-Amount-from-Cloud-inst(g/kg) |
| R2IC | rain2ice | Rain-Water-Collected-by-Ice-inst(g/kg) |
| AGGR | aggregate | Aggregation-of-Pris-Snow-inst(g/kg) |

3D MICROPHYSICAL TOTAL BUDGETS

** These values are accumulated between analysis (A) output files, so if you output Grid-1 every 15 minutes then you would get, for example, the sum of cloud vapor growth "VAPCLD" in g/kg/15-min. If Grid-2 is output every 5 minutes then units for "VAPCLD" would be g/kg/5-min. Also note that this only accumulates appropriately for standard analysis files and not LITE or MEAN files.

| | | |
|-------|-------------|---|
| NUCRT | nuccldr | Cloud-Nucleate-Mixing-Ratio-Total(g/kg) |
| CL2RT | cld2r | Cloud-to-rain-water-total(g/kg) |
| IC2RT | ice2r | Ice-to-rain-water-total(g/kg) |
| NUIRT | nucicr | Ice-Nucleated-Mixing-Ratio-Total(g/kg) |
| VAPLT | vapliq | Liq-Vapor-diff-evap-MixRatio-tot(g/kg) |
| VAPIT | vapice | Ice-Vapor-diff-evap-MixRatio-tot(g/kg) |
| MELTT | meltic | Melting-of-ice-total(g/kg) |
| RIMCT | rimecld | Rimed-Amount-from-Cloud-total(g/kg) |
| R2ICT | rain2ic | Rain-Water-Collected-by-Ice-total(g/kg) |
| AGGRT | aggrgat | Aggregation-of-Pris-Snow-total(g/kg) |
| LHVPT | latheatv | Lat-Heat-Vap-ThetaChange-total(dTheta) |
| LHFZT | latheatf | Lat-Heat-Frz-ThetaChange-total(dTheta) |
| IHMRT | inuchom | Homogeneous-ice-nucleation-total(mg/kg) |
| ICORT | inuccon | Contact-ice-nucleation-total(mg/kg) |
| IINRT | inucifn | IFN-ice-nucleation-total(mg/kg) |
| IHZRT | inuchaz | Haze-ice-nucleation-total(mg/kg) |
| VAPCT | vapcld | Vapor-DepEvap-Cloud-total(g/kg) |
| VAPRT | vapr | Vapor-DepEvap-Rain-total(g/kg) |
| VAPPT | vappr | Vapor-DepEvap-Pristine-total(g/kg) |
| VAPST | vapsnow | Vapor-DepEvap-Snow-total(g/kg) |
| VAPAT | vapaggr | Vapor-DepEvap-Aggregate-total(g/kg) |
| VAPGT | vapgr | Vapor-DepEvap-Graupel-total(g/kg) |
| VAPHT | vaphail | Vapor-DepEvap-Hail-total(g/kg) |
| VAPDT | vapdriz | Vapor-DepEvap-Drizzle-total(g/kg) |
| MELPT | meltpr | Melt-pristine-total(g/kg) |
| MELST | meltsnow | Melt-snow-total(g/kg) |
| MELAT | meltaggr | Melt-aggregates-total(g/kg) |
| MELGT | meltgr | Melt-graupel-total(g/kg) |
| MELHT | melthail | Melt-hail-total(g/kg) |
| RIMST | rimecldsn | Snow-rime-cloud-total(g/kg) |
| RIMAT | rimecldaggr | Aggr-rime-cloud-total(g/kg) |
| RIMGT | rimecldgr | Graupel-rime-cloud-total(g/kg) |
| RIMHT | rimecldhail | Hail-rime-cloud-total(g/kg) |
| R2PRT | rain2prt | Pristine-rime-rain-total(g/kg) |
| R2SNT | rain2snt | Snow-rime-rain-total(g/kg) |

| | | |
|--------|---------------|--------------------------------------|
| R2AGT | rain2agt | Aggr-rime-rain-total(g/kg) |
| R2GRT | rain2grt | Graupel-rime-rain-total(g/kg) |
| R2HAT | rain2hat | Hail-rime-rain-total(g/kg) |
| AGPPT | aggrselfprist | Pristine-Selfcollect-total(g/kg) |
| AGSST | aggrselfsnowt | Snow-Selfcollect-total(g/kg) |
| AGPST | aggrprisnowt | Pristine-Snow-collect-total(g/kg) |
| D1CRT | dust1cldrct | dust1-cloud-nucleation-total(g/kg) |
| D2CRT | dust2cldrct | dust2-cloud-nucleation-total(g/kg) |
| D1DRT | dust1drzrt | dust1-drizzle-nucleation-total(g/kg) |
| D2DRT | dust2drzrt | dust2-drizzle-nucleation-total(g/kg) |
| VNUCRT | vt_nuccldrct | vertically-integrated-nuccldrct(mm) |
| VCL2RT | vt_cld2raint | vertically-integrated-cld2raint(mm) |
| VIC2RT | vt_ice2raint | vertically-integrated-ice2raint(mm) |
| VNUIRT | vt_nucicert | vertically-integrated-nucicert(mm) |
| VVAPLT | vt_vapliqt | vertically-integrated-vapliqt(mm) |
| VVAPIT | vt_vapicet | vertically-integrated-vapicet(mm) |
| VMELTT | vt_melticet | vertically-integrated-melticet(mm) |
| VRIMCT | vt_rimecldt | vertically-integrated-rimecldt(mm) |
| VR2ICT | vt_rain2icet | vertically-integrated-rain2icet(mm) |
| VAGGRT | vt_aggregatet | vertically-integrated-aggregatet(mm) |

3D HYDROMETEOR DIAMETERS

| | | |
|-------|---------------|---------------------|
| TDIAM | cloudtop_diam | cloud-top-diam(um) |
| CDIAM | cloud_diam | cloud-diam(um) |
| RDIAM | rain_diam | rain-diam(mm) |
| PDIAM | pris_diam | pristine-diam(um) |
| SDIAM | snow_diam | snow-diam(mm) |
| ADIAM | agg_diam | aggregates-diam(mm) |
| GDIAM | graup_diam | graupel-diam(mm) |
| HDAIM | hail_diam | hail-diam(mm) |
| DDIAM | drizzle_diam | drizzle-diam(um) |

3D HYDROMETEOR TEMP, ENERGY, LIQUID FRACTION

| | | |
|------|-------------------|----------------------------|
| Q2RA | q2 | q2(J/kg) |
| Q6GR | q6 | q6(J/kg) |
| Q7HA | q7 | q7(J/kg) |
| RTMP | rain_temp | rain-temperature(K) |
| GTMP | graup_temp | graupel-temperature(C) |
| HTMP | hail_temp | hail-temperature(C) |
| RATD | rain_air_tempdif | rain-air-temp(K) |
| GATD | graup_air_tempdif | graupel-air-temp(K) |
| HATD | hail_air_tempdif | hail-air-temp(K) |
| GLIQ | graup_fracliq | graupel-liq-frac(fraction) |
| HLIQ | hail_fracliq | hail-liq-frac(fraction) |

3D MISCELLANEOUS FIELDS

| | | |
|------|-------------|----------------------------|
| HGHT | geo | geopotential-height(m) |
| TKET | tke | turb-kinetic-energy(m2/s2) |
| PBLH | pbl_ht | PBL-height(m) |
| DBZZ | reflect_all | radar-reflectivity(dBZ) |

3D CUMULUS PARM - RADIATION - TURBULENCE

| | | |
|------|-----------------|-----------------------------|
| CVHR | cuparm_thetasrc | conv-heat-rate(K/s) |
| CVMR | cuparm_rtsrc | conv-moist-rate(kg/kg/s) |
| KHHC | khc | horiz-diffusion-coeff(m2/s) |
| KHVC | khv | vert-diffusion-coeff(m2/s) |
| VISB | visibility | visibility(km) |
| AODT | aodt | Visible-Band-AOD(AOD) |

| | | |
|--------------------------|---------------------|---|
| SWUP | swup | shortwave-up (W/m ²) |
| SWDN | swdn | shortwave-down (W/m ²) |
| LWUP | lwup | longwave-up (W/m ²) |
| LWDN | lwdn | longwave-down (W/m ²) |
| RAHR | rad_thetasrc | rad-heat-rate (K/day) |
| NETR | column_net_rad_flux | column-net-radiative-flux (W/m ²) |
| NETF | sum_rad_flux | sum-rad-flux-up-down (W/m ²) |
| SWHT | sw_heat_rate | sw_heat_rate (K/day) |
| LWHT | lw_heat_rate | lw_heat_rate (K/day) |
| 2D SURFACE PRECIPITATION | | |
| ACCR | accpr | accum-rain (kg/m ²) |
| ACCP | accpp | accum-pristine (kg/m ²) |
| ACCS | accps | accum-snow (kg/m ²) |
| ACCA | accpa | accum-aggregates (kg/m ²) |
| ACCG | accpg | accum-graupel (kg/m ²) |
| ACCH | accph | accum-hail (kg/m ²) |
| ACCD | accpd | accum-drizzle (kg/m ²) |
| ACTA | accpaero | accum-total-aerosol-mass (mg/m ²) |
| ACDU | accpdust | accum-dust-aerosol-mass (mg/m ²) |
| DFRC | dustfrac | dust-erodible-fraction (fraction) |
| TRPM | totpcp | total-resolved-precip (mm-liq) |
| TRPI | totpcp_in | total-resolved-precip (in-liq) |
| TAPM | precip | total-accum-precip (mm-liq) |
| TAPI | precip_in | total-accum-precip (in-liq) |
| PCRR | pcpr | rain-precip-rate (mm/hr-liq-equiv) |
| PCVR | pcpvr | 3D-rain-pcp-rate (mm/hr-liq-equiv) |
| PCRP | pcprp | pristine-precip-rate (mm/hr-liq-equiv) |
| PCVP | pcpvp | 3D-pristine-pcp-rate (mm/hr-liq-equiv) |
| PCRS | pcprs | snow-precip-rate (mm/hr-liq-equiv) |
| PCVS | pcpvs | 3D-snow-pcp-rate (mm/hr-liq-equiv) |
| PCRA | pcpra | aggregates-precip-rate (mm/hr-liq-equiv) |
| PCVA | pcpva | 3D-aggregates-pcp-rate (mm/hr-liq-equiv) |
| PCRG | pcprg | graupel-precip-rate (mm/hr-liq-equiv) |
| PCVG | pcpvg | 3D-graupel-pcp-rate (mm/hr-liq-equiv) |
| PCRH | pcprh | hail-precip-rate (mm/hr-liq-equiv) |
| PCVH | pcpvh | 3D-hail-pcp-rate (mm/hr-liq-equiv) |
| PCRD | pcprd | drizzle-precip-rate (mm/hr-liq-equiv) |
| PCVD | pcpvd | 3D-drizzle-pcp-rate (mm/hr-liq-equiv) |
| PCPG | pcpg | pgpg (kg/m ²) |
| PCPQ | qpcpg | qpcpg (J/m ²) |
| PCPD | dpcpg | dpcpg (m) |
| PRRM | pcprate | resolved-precip-rate (mm/hr) |
| PRRI | pcprate_in | resolved-precip-rate (in/hr) |
| PRTM | precipr | total-precip-rate (mm/hr) |
| PRTI | precipr_in | total-precip-rate (in/hr) |
| CNPR | conpcp | convective-pcp-rate (mm/hr) |
| ACON | acccon | accum-convective-pcp (mm) |
| VMXW | vertmax_w | maximum-vertical-motion (m/s) |
| VAVW | vertavg_w | average-vertical-motion (m/s) |
| COND | vertint_cond | vertically-integrated-condensate (mm) |
| WATR | vertint_rt | vertically-integrated-total-water (mm) |
| VERT | vertint_orig | vertically-integrated-condensate (mm) |
| VRTV | vertint_vapor | vertically-integrated-vapor (mm) |
| VRTL | vertint_liq | vertically-integrated-liquid (mm) |
| VRTI | vertint_ice | vertically-integrated-ice (mm) |
| VRTC | vertint_cloud | vertically-integrated-cloud-water (mm) |
| VRTD | vertint_driz | vertically-integrated-drizzle (mm) |

| | | |
|------|--------------------|--------------------------------------|
| VRTR | vertint_rain | vertically-integrated-rain(mm) |
| VRTP | vertint_pris | vertically-integrated-pristine(mm) |
| VRTS | vertint_snow | vertically-integrated-snow(mm) |
| VRTA | vertint_aggr | vertically-integrated-aggregates(mm) |
| VRTG | vertint_graupel | vertically-integrated-graupel(mm) |
| VRTH | vertint_hail | vertically-integrated-hail(mm) |
| VTDU | vertint_dust | vertically-integrated-dust(g/m2) |
| VTDH | vertint_dust_hydro | vertint-dust-in-hydromets(ug/m2) |

2D SEA ICE – (not currently available)

| | | |
|------|----------------|----------------------|
| DEPS | snowdepthonice | snow-depth-on-ice(m) |
| DEPI | cicedepth | cice-depth(m) |
| ICEF | cicefract | cice-fraction(frac) |
| ICET | cicetemp | cice-temperature(C) |
| ICER | cicerough | cice-roughness(#) |

2D HEAT, MOISTURE, MOMENTUM AND RADIATIVE FLUXES

| | | |
|------|-----------|------------------------------|
| SFLX | sens_flux | sfc-sens-heat-flx(W/m2) |
| LFLX | lat_flux | sfc-lat-heat-flx(W/m2) |
| EVAP | etrans | evapo-transpiration(mm/hour) |
| ETRI | etrans_in | evapo-transpiration(in/hour) |
| UFLX | umom_flx | sfc-u-momentum-flx(Pa) |
| VFLX | vmom_flx | sfc-v-momentum-flx(Pa) |
| WFLX | wmom_flx | sfc-w-momentum-flx(Pa) |
| BOWN | bowen | bowen-ratio(fraction) |
| RSHT | rshort | rshort(W/m2) |
| RLON | rlong | rlong(W/m2) |
| RLNU | rlongup | rlongup(W/m2) |
| ALBE | albedt | albedt(fraction) |

2D TOPOGRAPHY AND GEOGRAPHIC VALUES

| | | |
|------|------|----------------|
| TOPT | topt | topography(m) |
| LATI | lat | latitude(deg) |
| LONG | lon | longitude(deg) |

2D MISCELLANEOUS FIELDS

| | | |
|------|-----------|-------------------------|
| MSLP | sea_press | sea-level-pressure(mb) |
| SDIV | sfc_div | surface-divergence(1/s) |
| SSTC | sst | water-temperature(C) |

LEAF/SIB VARIABLES SECTION

**Note that variables with the name “_ps” are the Patch Sum values and the “_bp” are the Biggest Patch or dominant class values.

| | | |
|------|---------------|---------------------------------|
| PFRA | patch_area | patch-fractional-area(fraction) |
| OCEN | water | water-fractional-area(fraction) |
| LAND | land | land-frac-area(fraction) |
| SNOL | snow_levels | number-of-snow-levels(#) |
| SNOD | snow_depth_ps | snow-depth(m) |
| SNOM | snow_mass_ps | snow-water-equivalent(kg/m2) |
| SNOT | snow_temp_ps | snow-water-temperature(C) |
| TRUF | topo_z0_ps | topo-roughness(m) |
| NRUF | net_z0_ps | net-roughness(m) |
| SRUF | soil_z0_ps | soil-roughness(m) |
| VRUF | veg_z0_ps | vegetation-roughness(m) |
| NDVI | veg_ndvi_ps | veg-ndvi(#) |
| VEGC | veg_class_bp | dominant-vegetation-class(#) |

| | | |
|------|-------------------|-----------------------------------|
| VEGA | veg_albedo_ps | vegetation-albedo(fraction) |
| VEGF | veg_fracarea_ps | vegetation-frac-area(fraction) |
| LAIF | veg_lai_ps | leaf-area-index(#) |
| VDIS | veg_disp_ps | vegetation-displacement-height(m) |
| CANM | canopy_mixrat_ps | canopy-mixing-ratio(g/kg) |
| GRDM | grnd_mixrat_ps | ground-mixing-ratio(g/kg) |
| SOIM | soil_mixrat_ps | soil-mixing-ratio(g/kg) |
| VEGM | veg_moist_ps | vegetation-moisture(kg/m2) |
| VEGT | veg_temp_ps | vegetation-temperature(C) |
| CANC | canopy_tempc_ps | canopy-temperature(C) |
| CANF | canopy_tempf_ps | canopy-temperature(F) |
| USTR | ustar_ps | ustar(m/s) |
| TSTR | tstar_ps | tstar(K) |
| RSTR | rstar_ps | rstar(kg/kg) |
| SLTX | sltex_bp | dominant-soil-textural-class(#) |
| SOIQ | soilq_ps | soil-energy(J/m3) |
| SOIT | soil_temp_ps | soil/sea-temp(C) |
| SLMS | soil_moist_ps | soil-moisture(m3/m3) |
| SLMF | soil_moistfrac_ps | soil-moisture-fraction(m3/m3) |
| 50TC | 5050_tempc_ps | avg-canopy-airlev2-tempC(C) |
| 50TF | 5050_tempf_ps | avg-canopy-airlev2-tempF(F) |

SIB VARIABLES SECTION

**Note that variables with the name "_ps" are the Patch Sum values

| | | |
|------|-------------|---|
| CO2C | co2_concen | co2-concentration(ppm) |
| SNO1 | snow1_ps | vegetation-snow(kg/m2) |
| SNO2 | snow2_ps | ground-surface-snow(kg/m2) |
| CAP1 | capac1_ps | vegetation-liquid-store(kg/m2) |
| CAP2 | capac2_ps | ground-surface-liquid-store(kg/m2) |
| PCOA | pco2ap_ps | CAS-co2-concen(Pa) |
| CO2F | co2flx_ps | surface-co2-flux(umol/m2/s) |
| SFAL | sfcswa_ps | surface-albedo(fraction) |
| SFUP | uplwrflw_ps | surface-longwave-upward-rad(W/m2) |
| ASSM | assimn_ps | canopy-uptake-of-co2(umol/m2/s) |
| RESP | respg_ps | ground-respiration-flux(umol/m2/s) |
| RST1 | rstfac1_ps | leaf-surface-humidity-resistance(#) |
| RST2 | rstfac2_ps | soil-moisture-resistance-stress(#) |
| RST3 | rstfac3_ps | temperature-resistance-stress(#) |
| ECTF | ect_ps | transpiration-flux(W/m2) |
| ECIF | eci_ps | canopy-interception-flux(W/m2) |
| EGIF | egi_ps | ground-interception-flux(W/m2) |
| EGSF | egs_ps | ground-surface-layer-evaporation(W/m2) |
| HCFX | hc_ps | canopy-sensible-heat-flux(W/m2) |
| HGFX | hg_ps | ground-surface-sensible-heat-flux(W/m2) |
| RAST | ra_ps | CAS-to-atmos-resistance(s/m) |
| RBST | rb_ps | leaf-surface-to-CAS-resistance(s/m) |
| RCST | rc_ps | total-canopy-resistance(s/m) |
| RDST | rd_ps | ground-to-CAS-resistance(s/m) |
| ROFF | roff_ps | water-runoff(mm) |
| GREN | green_ps | greenness-fraction(fraction) |
| APAR | apar_ps | absorbed-fraction-of-PAR(fraction) |
| VENT | ventmf_ps | ventilation-mass-flux(kg/m2/s) |
| PCOC | pco2c_ps | leaf-chloroplast-co2-concen(Pa) |
| PCOI | pco2i_ps | leaf-internal-co2-concen(Pa) |
| PCOS | pco2s_ps | leaf-surface-co2-concen(Pa) |
| PCOM | pco2m_ps | lowest-atmos-level-co2-concen(Pa) |

| | | |
|------|-----------|-------------------------------------|
| EAPR | ea_ps | canopy-water-vapor-pressure(hPa) |
| EMPR | em_ps | reference-level-vapor-pressure(hPa) |
| RHAC | rha_ps | CAS-relative-humidity(fraction) |
| RVDR | radvbc_ps | visible-direct-radiation(W/m2) |
| RVDF | radvdc_ps | visible-diffuse-radiation(W/m2) |
| RNDR | radnbc_ps | NIR-direct-radiation(W/m2) |
| RNDV | radndc_ps | NIR-diffuse-radiation(W/m2) |
| PSYC | psy_ps | psychrometric-constant(hPa/deg) |

KPP OCEAN MIXED LAYER MODEL VARIABLES

| | | |
|------|--------------------|-----------------------------|
| KHMX | kpp_hmix | kpp-mixed-layer-depth(m) |
| KOCD | kpp_ocdepth | kpp-ocean-depth(m) |
| KFUS | kpp_flx_ust | kpp-uwnd-stress(N/m2) |
| KFVS | kpp_flx_vst | kpp-vwnd-stress(N/m2) |
| KNSW | kpp_flx_nsw | kpp-shortwave-flux(W/m2) |
| KNLW | kpp_flx_nlw | kpp-longwave-flux(W/m2) |
| KICE | kpp_flx_ice | kpp-ice-flux(not-used) |
| KPCP | kpp_flx_pcp | kpp-freshwater-flux(mm/sec) |
| KDTP | kpp_depth_temp | kpp-depth-temperature(C) |
| KDSL | kpp_depth_salinity | kpp-depth-salinity(o/oo) |

RAMS TRACER VARIABLES

The number of the tracer variables in REVU will have to correspond with the number of scalar tracers added to the model. By default, in the model and REVU code, the aerosol sub-micron CCN category 1 and the dust mode categories 3 and 4 are used for tracer initialization. 6 tracers are set that are initialized identical to CCN, DUST1, DUST2 number concentration and mass mixing ratio. This default is set in order to compare processed and unprocessed CCN and DUST aerosols. The tracer variables are passive and thus only diffused and advected throughout the model.

| ASCII ID: | REVU INPUT NAME: | Description with units: |
|-----------|------------------|--------------------------------------|
| T001 | tracer001 | Tracer #001 (units depend on tracer) |
| T002 | tracer002 | Tracer #002 (units depend on tracer) |

Tracer output pattern continues to the maximum number of tracers.

RAMS BUDGET VARIABLES IN VERSION 6+

This is the list and description of the currently available microphysical budget variables as well as several others. Most variables are time accumulated between model analysis file writes, while others are instantaneous values. After each analysis file write time (grid dependent), the time-accumulated variables are reset to zero and begin new accumulations. Instantaneous variables are reset to zero each timestep and recomputed. The variables are 3D scalars but have no tendencies since they are diagnostic only. However, memory must be allocated for these variables; as such, use of these variables can require substantially more system memory.

NOTES:

1: Time accumulated variables end with the letter "t".

2: For microphysical budgets (mixing ratio units), in micphys.f90 there is a variable called "budget_scalet". This is set to 1.0 by default. This retains units in the analysis files as (kg/kg). If the user needs to scale the output units then this can be modified. If budget_scalet=1000. then all microphysical

budget outputs are multiplied by 1000 and units would be accumulated in (g/kg). If you are not using a value of 1, then the output of the variables in REVU will not correspond to the units given in revu.

3: Below is mention of the terms "rcx", "rcy", and "xtoz". These refer to RAMS' collection routines and the contribution of collection by a particular contributing species and the end destination category of hydrometeors undergoing collision-coalescence. The user should refer to the file mic_coll.f90 for a specific understanding of these variables.

4: Time accumulation is grid-dependent. If grid-1 is output only every 3-hours then its budget variables will be accumulated for 3 hours before being reset when its analysis file is written. If grid-2 for the same simulation is output every 15-minutes, the the variables will be accumulated for 15-minutes and reset to zero when grid-2 analysis files are written. The different grids do not interfere with one another.

5: The resetting of time accumulated budgets only pertains to ANALYSIS files and NOT LITE or MEAN files.

6: Be aware that the sum of the microphysical processes for hydrometeor type X will not equal the mixing ratio or change in mixing ratio of hydrometeor X. This is due to application of microphysical adjustment schemes, positive definite schemes, addition of other tendencies (advection + diffusion), and data filtering that are applied to the predicted mixing ratio and determine the total prognostic values. Further, we do no output every microphysical contribution that leads to predicted mixing ratio.

7: Addition of other microphysical budgets requires allocating memory in the file mem_micro.f90 as well as adding 1D temporary variables in micphys.f90 under the header "Variables Needed for COMPUTING BUDGETS".

8. Several non-microphysical budgets exist and are allocated in mem_basic.f90. These are NOT declared elsewhere in temporary variables as are the microphysical budgets.

For RAMSIN flag IMBUDGET = 1

wp_adv_dif = instantaneous vertical velocity contribution by the combination of both advection and diffusion

wp_buoy_theta = instantaneous vertical velocity contribution from Theta-V buoyancy computation

wp_buoy_cond = instantaneous vertical velocity contribution from condensate loading

latheatvap = instantaneous change in Theta due to vapor diffusion and cloud & ice nucleation

latheatfrz = instantaneous change in Theta due to collision-coalescence and melting routines

nucclprt = nucleation of cloud and drizzle water mixing ratio

cld2raint = cloud water transferred to rain via collection

ice2raint = ice melting due to collection of rain (rcy values)

nucicert = nucleation of pristine ice mixing ratio from all nucleation mechanisms

vapliqt = vapor deposition summed for all liquid hydrometeor species (this can be + or - depending on growth or evaporation)

vapicet = vapor deposition summed for all ice hydrometeor species (this can be + or - depending on growth or evaporation)

melticet = melting of all ice species in melting routine

rimecldt = cloud water collected by all ice species (rcx values)

rain2icet = rain water collected by ice species (rcx values)

aggregatet = ice amount transferred to aggregates via collection

latheatvapt = change in Theta due to vapor diffusion and cloud & ice nucleation

latheatfrzt = change in Theta due to collision-coalescence and melting routines

For RAMSIN flag IMBUDGET = 2 (include all above +)

inuchomrt = homogeneous ice nucleation

inucconrt = contact ice nucleation

inucifnrt = heterogeneous ice nucleation via IN (Meyers or DeMott activation)

inuchazrt = haze nucleation (from deliquesced CCN)

vapcldt = vapor deposition for cloud (+/- for growth or evaporation)

vapraint = vapor deposition for rain (+/- for growth or evaporation)

vapprist = vapor deposition for pristine ice (+/- for growth or evaporation)

vapsnowt = vapor deposition for snow (+/- for growth or evaporation)

vapaggrt = vapor deposition for aggregates (+/- for growth or evaporation)

vapgraut = vapor deposition for graupel (+/- for growth or evaporation)

vaphailt = vapor deposition for hail
(+/- for growth or evaporation)

vapdrizt = vapor deposition for drizzle
(+/- for growth or evaporation)

meltprist = melting of pristine ice in melting routine

meltsnowt = melting of snow in melting routine

meltaggrt = melting of aggregates in melting routine

meltgraut = melting of graupel in melting routine

melthailt = melting of hail in melting routine

rimecldsnowt = cloud water collected by snow (rcx value)

rimecldaggrt = cloud water collected by aggregates (rcx value)

rimecldgaut = cloud water collected by graupel (rcx value)

rimecldhailt = cloud water collected by hail (rcx value)

rain2prt = rain water collected by pristine ice (rcx value)

rain2snt = rain water collected by snow (rcx value)

rain2agrt = rain water collected by aggregates (rcx value)

rain2grt = rain water collected by graupel (rcx value)

rain2hat = rain water collected by hail (rcx value)

aggrselfprist = transfer of pristine ice to aggregates via self-
collection

aggrselfsnowt = transfer of snow to aggregates via self-collection

aggrprissnowt = transfer of snow and pristine ice to aggregates via
inter-collection

For RAMSIN flag IMBUDGET = 3 (include all above +)

dust1cldr = cloud water nucleated via the small dust mode

dust2cldr = cloud water nucleated via the large dust mode

dust1drzrt = drizzle water nucleated via the small dust mode

dust2drzrt = drizzle water nucleated via the large dust mode