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Model Name and History:

- Full name: Scripps Institution of Oceanography Single-Column Model version 3.03
- Acronym: Scripps SCM
- Short/conversational name (other than acronym, if any)
- Generic predecessor or relative (name/variant, and acronym, whether or not it also takes part in this study)

On attributes listed below, please be as complete as would be required to satisfy the editor of a journal article.

For each additional model you have participating in this study, you need to fill out a separate page. With proper reference, omission of redundant attribute information is allowed (if you write "AsGP" or "AsGR" (As its Generic Predecessor or Relative), and have cited the prior model, where asked (as above).

Model Type: (1D, 2D, 3D): 1D vertical column

Numerical Domain:

- Domain size in x-direction: Variable; approximately that of an AGCM grid cell
- Domain size in y-direction: Variable; approximately that of an AGCM grid cell
- Domain size in z-direction: Surface to top of atmosphere
- Number of grid points in x-direction: 1
- Number of grid points in y-direction: 1
- Number of grid points in z-direction: currently set to 53 unequally spaced vertical levels
- Grid size in x-direction: Same as domain size
- Grid size in y-direction: Same as domain size
- Grid size in z-direction (if stretched please specify):
- Time step: 450 seconds

Numerical Technique:

- Numerical method (finite-difference, spectral, etc.): finite-difference
- Advection scheme and its order of accuracy: Horizontal advection calculated from observed values of u, v, T and q. For period A, total advection was used, which included vertical advection calculated from ω
- Time scheme and its order of accuracy: Model timestep is 450 seconds, while LW and SW parameterizations are called hourly
- Dynamical equations (elastic, anelastic, etc.): None
- Numerical diffusion (type, order, magnitude of coefficient): None
- Lateral boundary conditions: No conditions not normal for an SCM
- Upper boundary condition (Sponge layer, specification, ...): No conditions not normal for an SCM
- Translation velocity of the reference frame: None
- Other information

Physical Parameterizations:

- Surface flux parameterization for heat, moisture, momentum: CCM3 routine calculates vertical diffusion of heat and moisture and distributes the surface fluxes of heat and moisture within the atmospheric column
- Longwave radiation parameterization: RRTM
- Shortwave radiation parameterization: Fouquart and Bonnel [1980]
- How were radiative fluxes above the computational domain handled?
Solar = downwelling solar calculated at TOA as function of latitude and time of year
Longwave = zero downwelling longwave at TOA
- Microphysical (2D/3D models) or cloud/convective (1D model) parameterization: type, number of hydrometeor classes, ... Convection uses the Zhang-McFarlane (CCM3 Version) [1995] package, which includes a parameterization for shallow convection (Hack scheme). For cloud formation, the Tiedtke [1993] parameterization is used. Cloud optical thickness is calculated using the Slingo/Ebert-Curry scheme. Cloud optical thickness is calculated as a function of cloud droplet radius and cloud water path. Slingo [1989] is used for liquid water clouds and Ebert and Curry [1992] is used for ice clouds. Droplet effective radius is determined as a function of cloud liquid water [Bower et al., 1994]. Ice crystal effective radius is determined as a function of temperature and IWC using the McFarquhar method.
- Turbulence closure scheme (turbulence closure type, variables predicted and diagnosed by - - the turbulence closure, closure for turbulent length scale, ...) CCM3
- Other information

Documentation:

Please provide references that more fully describe your model.

Iacobellis, S. F., and R. C. J. Somerville, 2006: Evaluating parameterizations of the autoconversion process using a single-column model and Atmospheric Radiation

Measurement Program measurements. Journal of Geophysical Research, 111, D02203, doi:10.1029/2005JD006296.

- Documentation (present model), if available.
- Documentation (predecessor or relative) – optional if the preceding is available.