DCOTSS

NASA Earth Venture Suborbital 3
Dynamics and Chemistry of the Summer Stratosphere

Convection-Allowing Model Output

CAM Output

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Data Collection/Creation Process

- Convection-allowing model simulations will be conducted for select flights (those extensively sampling overshoot material)

- Cases chosen will range from weakly forced convection (difficult to reproduce) to strongly forced convection

- Simulations will be run for up to 48 hours

- Anticipated models to be used –

  1. The Weather Research and Forecasting model with chemistry (WRF-Chem) – for real events

  2. Cloud Model 1 (CM1) – idealized experiments with added tracers

File Structure & Content

- Files output from most modern research CAMs (incl. WRF-Chem and CM1) are netCDF format, which is what will be archived

- Simulation domains for DCOTSS missions will encompass an area slightly larger than the flight path

- Initial and boundary meteorological conditions for WRF-Chem will be sourced from reanalysis (likely ERA5)

- Output will be saved at a 1-hr frequency at a minimum, likely as small as 5 min during the time period the observed systems were sampled

Data Limitations & Considerations

- As is true for any CAM simulation, the simulated storm(s) will not be equivalent to the observed storm(s)

- Common issues in model simulations are:

  1. Offsets in time and space between observed and simulated storms

  2. Under/over-represented storm intensity (depth, etc.)

  3. Poor replication of storm mode, duration, or evolution

- Users of the model output should familiarize themselves with the model design and its implications, informed by the developers of the community models used

Tentative Archival Timeline

- CAM output will be archived as it is produced and evaluated

- Thus, there is no known timeline for archival

- All output used for analysis/publication will be archived as soon as possible (ideally no longer than 1-2 years following each deployment, when the DCOTSS team will be completing such)

- All model design information (setup or "input" files) will be included in the archived files