

**GMI Science Team Status Report
July-Dec 2007**

Next Meeting: March 17-19, 2008 (Mon-Wed) at the University of California, Irvine.

Simulations of the Aura Period (2004-2006)

1. The 'aura3' simulation uses GEOS4-DAS met fields, combo chemistry, and a new lightning parameterization. Other than the new lightning, the only major change is that a heterogeneous HO₂ uptake reaction was turned back on. Aerosol fields for 2004-6 are also used. Output directory is:
/pub/gmidata2/output/gmic/
2. 'aura4' using GEOS4-DAS met fields is about to begin. New features include a new profile for injection of lightning-produced NO_x with the same lightning parameterization as aura3. There are diurnally varying CO₂ and NO emissions.
3. 'aura2for12h' is a 1-yr combo chemistry experiment (July 2004-June 2005) that uses GEOS4-forecast fields (18-30 hr forecasts with updates every 12 hours). The model build 'aura2' uses the old lightning parameterization. Output directory is:
/pub/gmidata2/output/gmic/aura2for12h/YYYY
4. 'aura2for24h' is a 1-yr combo chemistry experiment (July 2004-June 2005) that uses GEOS4-forecast fields (12-36 hr forecasts with updates every 24 hours). Old lightning parameterization. Output directory is:
/pub/gmidata2/output/gmic/aura2for24h/YYYY

All model output can be obtained via anonymous ftp to [dirac.gsfc.nasa.gov](ftp://dirac.gsfc.nasa.gov). Contact Susan Strahan for IDL readers for these and other simulations.

Other Simulations

Five-year run with GEOS4-GCM 1994-1998 SST 3-hr update met fields using the aura3 model build. New lightning parameterization, emissions and source gas boundary conditions appropriate to 1994-8. The model version is the same as 'aura3'. Output directory is: /pub/gmidata2/output/gmic/fvgcm/ap1.0OHO2Aura2Fvgcm/YYYY

The advection-only, resolution doubling 10-yr CO₂ experiment using GISS met fields has been successfully completed. Michael Prather is writing a paper that compares convergence of two difference advection cores as resolution increases. The advection cores are Second Order Moments from the UCI CTM and Lin and Rood (tpcore) from the GMI CTM.

A modified version of the GMI aerosol model was used to integrate source-receptor experiments for 4 regions: N. America, Europe, E. Asia, and S. Asia. Both baseline (SR1) and perturbation runs (SR6) were submitted to HTAP (Hemispheric Transport of Atmospheric Pollutants, <http://www.htap.org>). This work was supervised by Huisheng Bian.

Eighteen simulations using the tropospheric model were integrated for the HTAP study of source-receptor relationships for ozone and its precursors (NO_x, NMHC, CH₄, and CO). The results were submitted to HTAP. This work was supervised by Bryan Duncan.

The Combo chemical mechanism has been successfully implemented in GEOS5. Bryan is working on providing them necessary input files for emissions?

Other News

GMI was selected to participate in the ARCTAS mission that will take place in April and July, 2008 (PI, Jose Rodriguez). Members of the GMI team will offer forecast support in the field, and the model will be used for post-mission analysis of the measurements. Participating GMI members include Bryan Duncan, Huisheng Bian, and Mian Chin.

All of the LLNL 'ESM' framework has been removed from the GMI model. The consequence of this are that the initialization process (reading the namelist file, domain decomposition, variable allocations, have) has been greatly simplified, the code is easier to read, and domain related information is easily passed to other GMI components.

Work has begun on implementing 'advecCore', the new advection core to replace TP Core. The tentative plan is to have the advecCore code implemented and ready to test by January 31, 2008.

Version numbers have been established for the GMI code.

Several changes have been or are being done to the emissions in the GMI code. MEGAN emissions are being implemented. In addition, the capability to use hourly NO and other species biomass burning emissions is being added.

An updated and expanded GMI User's Guide is being prepared.

A spreadsheet summarizing recent production runs will be posted on the GMI website. The spreadsheet includes information about the emissions, met fields, and lightning parameterization (among many other features) associate with these runs.

Work has begun on a table for the GMI website that provides a more in-depth description of specific features of the model runs. The table will contain links to more detailed information about model inputs including, but not limited to, emissions files.

