

Possible Issues for Discussion

1. How do we proceed with GEOS-5 replay vs. existing CTM?
2. Strategy for incorporation of modules into CCM (GMI first?)
 - Aerosol-gas phase chemistry coupling
 - Aerosol – cloud interactions (Georgia Tech.)
3. Use of other fields (ECMWF – GFDL)
 - Who is interested and what specific problems?
 - Other advection algorithms
 - SOW
 - Cubed sphere
4. Role of GMI – Community resource
5. GMI productivity – Papers in progress?
 - Please email or give me a list of papers in progress for discussion on Tuesday morning.
6. Fields to use for hindcast models.
7. Outstanding issues:
 - OH differences between Harvard, GMI
8. What simulations should GMI carry out in the next 6-9 months?

1. PAPERS IN PROGRESS – SUMMER?

Allen, D., K. Pickering, B. Duncan, S. Strahan, J. Rodriguez, Impact of lightning-NO emissions on North American photochemistry as determined using the GMI model, in preparation, J. Geophys. Res.

Bian, H., M. Chin, R. Kawa, H. Yu, T. Diehl, T. Kucsera, Multi-scale aerosol and CO correlations from MODIS and MOPITT satellites and GOCART model: implication for their emissions and atmospheric evolutions. Submitted to J. Geophys. Res., 2009.

Liu, H., D.B. Considine, et al., Using beryllium-7 to assess stratosphere-to-troposphere transport in global models, manuscript in preparation, J. Geophys. Res., 2009.

Dianostic for strat. O₃

Evaluation of GMI Aura-4 runs with TES, MLS and in-situ data Logan et al.

Run Aura 4 with new lightning.

CO Tape Recorder Logan et al.

Archive daily OH? (If rerun)

In addition, I have received 35 additional citations for manuscripts which have been at least partially supported by the GMI project/data.

2. FUTURE SIMULATIONS

AURA Period with GEOS-5 – (Version 5.2, MERRA?)
(2000-2007, add 2008 when biomass burning is available).

Need to spin-up stratosphere with GEOS-5

Need to:

Adapt field processing from MERRA

Process fields

Run

Tagged CO runs

What about hindcast? GEOS-4? GEOS-5?

Calculate STE O3 from GEOS5 (M. Olson)

Run with CCM forced by time-tagged emissions

Note: Be 7 are similar.

Simplified chemistry? (Take from LLNL?)

3. ISSUES TO RESOLVE

A. Differences in OH, J(O1D) between GEOS-CHEM and GMI.
Follow Jennifer's strategy to diagnose difference.
Rerun AURA with new lightning.

B. GMI CTM VS. GEOS 5

1. We need to balance continued GMI simulations (see above, aircraft assessment), with migration to GEOS-5.

2. Suggested strategy for migration:

a. "In the background": Understand reason for anomalous behavior/excessive mixing in replay simulations

1. Bug? – Need convergence/divergence diagnostics –

2. If true, determine limitations on appropriate use of replay.

b. Include a capability of reading/using archived fields into the GEOS-5 system.

C. Aerosol – gas phase chemistry coupling; aerosol-cloud interactions

1. Nielsen, Steenrod, others to assess complexity of incorporating changes in GMI into CCM (June) –

2. GIT to test version of aerosol-cloud interaction in GMI main trunk.

3. Future aerosol-cloud interaction work

Ideally, put in CCM. However, full coupling would change hydrological cycle, energy balance, etc. – Problem for full climate model???

Use of GMI as test-bed for some issues?

Use CCM without “full” coupling for cloud changes? Or document changes?

a. Use GOCART in GMI (incorporated essentially?) – Bian, Chin to determine remaining tasks in this (summer?)

b. Need to use microphysical model at some point – CCM?

D. Use of other fields

a. Need a “regridding” working group:

Prather – ECMWF

Liu – GFDL

Steenrod, Damon, Rodriguez – GMI

Develop consistent? regridding software for archived fields.

Try to have a mini-meeting this summer.

b. Tracer tests in ECMWF and GMI; GFDL and GMI.

c. Test with replay mode in GEOS-5

E. Other advection algorithms?

1. Jules, Gary: Look at Prather code, and determine how easy it would be to “extract” his advection algorithm, parallelization. (By July?)

2. Philosophical question: Importance of “uncertainty analysis” – Need HQ buy-in.

F. Use of GMI as “resource”

1. Current and future satellite missions?

2. Assessment?

G. Next meeting? (Suggest 9 months from now).