GMI Status

GODDARD SPACE FLIGHT CENTER

Gary S. Wojcik
Megan R. Damon
Jules Kouatchou

Software Integration and Visualization Office

SIVO GMI Computing Team

GMI Science Meeting
May 11-12, 2009
GSFC

Outline

- SIVO GMI Personnel
- SIVO GMI Duties
- SIVO Support to GMI Community
- GMI Accomplishments since 3/2008
- Current Tasks

Personnel

- Gary Wojcik (0.1 FTE)
  - Northrop Grumman
    - GMI Computing Project Leader
    - SIVO Program Manager (contractors)
- Jules Kouatchou (0.5 FTE)
  - AMTI, Programmer/developer
- Megan Damon (0.7 FTE)
  - Northrop Grumman, Programmer/developer

GMI Duties

- **Assist GMI community with the code**
  - **Standard assistance**
    - **Obtaining**
    - **Building**
  - **Specialized assistance**
    - **Converting/Developing/Implementing modules in ESMF framework**
    - **Parallelization/Optimization**
  - **Code change requests**
    - **Requires user input**
    - **Must follow SIVO coding standards**

GMI Duties

- Transition users to the workflow tool for runs
- Perform requested runs, when necessary
- Process, archive, and distribute data
- Manage the GMI CVS repository

SIVO Support to GMI Community

- GSFC GMI Scientists
- GMAO
- Georgia Tech
- AER
- NASA-Langley
- Harvard
- UC-Irvine

Accomplishments

- **Completed Model Runs**
  - **Aura4 with GEOS4DAS metfields, 2x2.5x42**
    - **Aura4 2007 (GMI core team)**
    - **No Indonesian wildfire emissions (Bryan Duncan)**
      - **7-12/2006**
      - **No wildfire aerosol dust emissions, 7-12/2006**

Accomplishments

- **Completed Production Runs**
  - **Aura4 with GEOS4DAS metfields, 2x2.5x42**
    - **Lightning sensitivity (Dale Allen)**
      - **With updated local and global ratios, 2004-2006**
      - **Lightning sensitivity with mid-latitude adjustment, 2004-2006**
    - **No biomass burning emissions, 2006 (Sushil Chandra)**
    - **With qk and qj values in overpass2, 8-10/2005 (Bryan Duncan)**

Accomplishments

- **Completed Production Runs**
  - **DAO metfields 4x5x46 resolution, 3/1997-3/1998 (Hongyu Liu)**
  - **GISS metfields 4x5x23 resolution, 1/1977-12/1977 (Hongyu Liu)**
- **Lightning algorithm**
  - **Local and global adjustments to flash rates read from file**
  - **Mid-latitude adjustments read from file**

Accomplishments

- **GEOS-5 Metfields for GMI**
  - **GMI code was changed for new fields**
    - **Required return to NCAR convection scheme (only one convective flux)**
    - **Placed correct variables into proper arrays (moisture and convective parameters in particular)**
    - **Made convective mass fluxes and kzz's available on interfaces for all (73) levels**
    - **Modified fastjx to handle a few more levels (was 70)**

Accomplishments

- GEOS-5 Metfields for GMI
  - Special treatment of optical depth (calculated outside of code)
  - New metfield processing scripts developed for Discover
  - Metfield processing
    - Jan-Nov 2008
    - Jan-Jul 2007 (Aug-Dec in progress)
    - Jun-Dec 2006 (Jan-Jul in progress)
    - Jan-Dec 2005
  - Steve ran 1 year test, Jul 2006-Jun 2007

Accomplishments

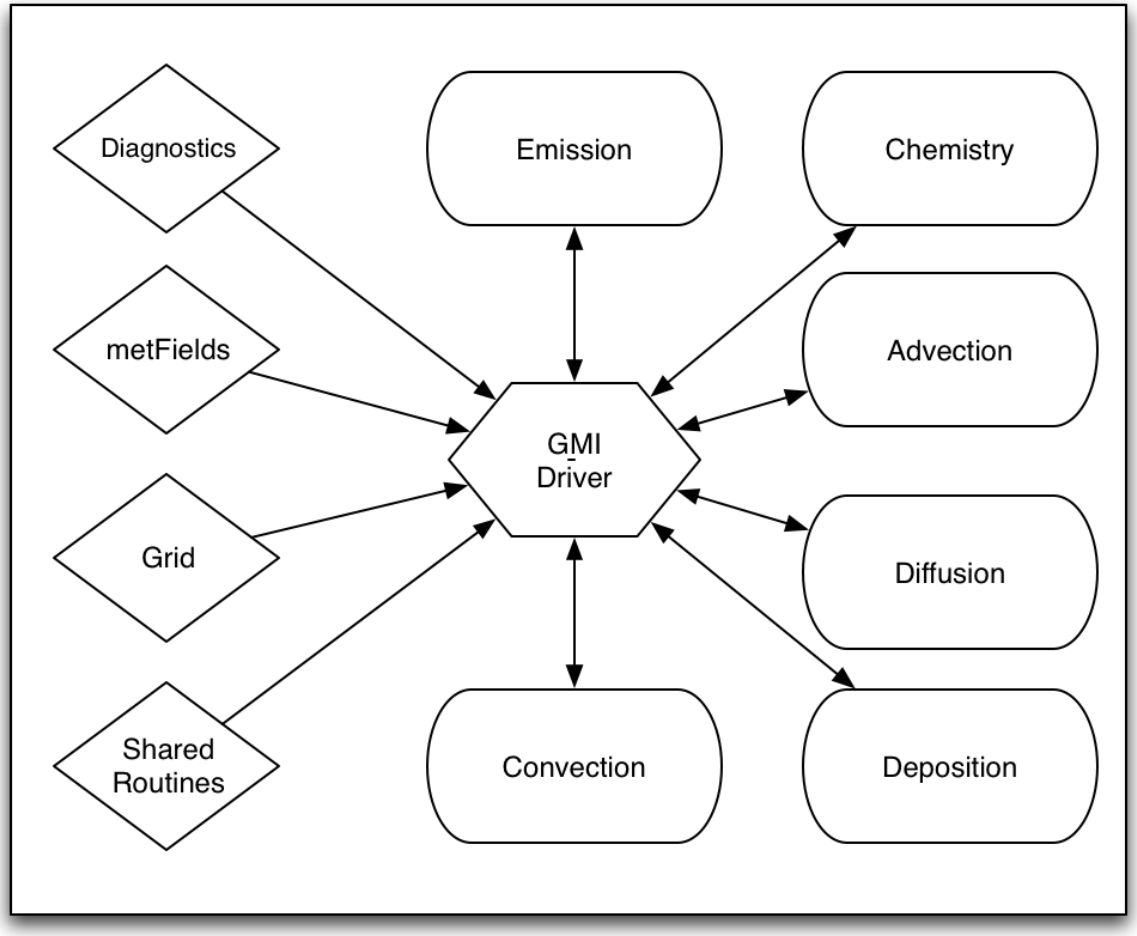
- **GMI Workflow Tool**
  - **Held training sessions with local GMI scientists**
  - **Used to do most of the Aura4-based production runs over the past year**
  - **Development continues for newest version of the code**
    - **Support ESMF resource file**
    - **Uses GEOS5 metfields**
  - **Want more people to use it**
  - **GEOS-5 w/Combo chemistry will be done through the workflow tool**

Accomplishments

- New code features/functionality
  - Code is fully componentized and ESMF ready
  - Code initialized (message passing) through ESMF and driven with an ESMF clock
  - Resource file replaces namelist file
  - New domain decomposition (n-processor decomposition)
  - New code directory structure (legacy code was completely removed)

Accomplishments

- **GMI Code Components**



Accomplishments

- New code features/functionality
  - advecCore was implemented as an ESMF component but is still being tested
  - ESMF is required to compile the code
  - Each output file can now be produced at its own frequency

Current Tasks

- **Aerosol-related (GOCART, Michigan aerosol, Michigan micro-aerosol)**
  - **Assist Huisheng Bian with implementation of gas phase-aerosol chemistry**
  - **Coupling predicted dust and aerosol from GOCART to GMI-Combo**
- **Updating GMI workflow**
- **Create GMI workflow to process GEOS-5 metfields**
- **Support users on the workflow tool**
- **Work with Will Sawyer on advecCore**

Current Tasks

- Other lingering issues
  - Georgia Tech Cloud module was incorporated in GMI, but needs to be tested
  - Debra Weisenstein's chemical mechanism
    - Assisted her with putting mechanism in her version of the code and she is happy with the results
    - Would take a few hours to implement in main GMI code

Thank you!

gary.s.wojcik@nasa.gov (240) 778 5699

jules.kouatchou-1@nasa.gov

megan.r.damon@nasa.gov