

GGCM Model Metrics Challenge

- Summary of Challenge Status.
Introduction of CCMC Metrics Tools.
(Masha Kuznetsova – 10 min, Anna Chulaki – poster)
- Challenge Results Update – 1 hour
 - Antti Pulkkinen
 - Lutz Rastaetter
 - Joe Borovsky
- Publication Plans (Discussion) – 10 min
- NOAA SWPC Needs (Howard Singer) – 10 min
- Future Plans, New Ideas – 15 min

Modeling Challenge Goals

- Address the differences between various modeling approaches
- Evaluate the current state of the space physics modeling
- Demonstrate effects of model coupling, grid resolution
- Encourage collaborations.
- Facilitate further model improvements.

Events and Physical Parameters

Selected at GEM 2008 Summer Workshop

Event 1: Oct 29, 2003 06:00 UT - Oct 30, 06:00 UT

Event 2: Dec 14, 2006 12:00 UT - Dec 16, 00:00 UT

Event 3: Aug 31, 2001 00:00 UT - Sep 01, 00:00 UT

Event 4: Aug 31, 2005 10:00 UT - Sep 01, 12:00 UT

Metric Study 1: Magnetic field at geosynchronous orbit

Metric Study 2: Magnetopause crossings by geosynch. satellite

Metric Study 3: Plasma density/temperature at geosynch. orbit

Metric Study 4: Ground magnetic perturbations*

*(added on request from NOAA SWPC represented by Terry Onsager)

Need for Web-Based Metrics Tools To Allow Broader Community Participation

- Need an automated system that allow to repeat the exercise on regular basis (annually or semi-annually)
- Need a web-accessible database to keep track of challenge results and monitor progress over time.

CCMC On-Line Metrics Tool Suite

- Simulation results submission interface
Accepts time series derived from simulation results obtained outside the CCMC. Interactive file format check.
- Database of model settings
Model setting (model/combination of models, version, number of grid cell, max resolution..) as a main database entry.
- On-line time series plotting tool.
Observations and simulation output for different model settings at the same plot (for selected event, physical parameter, event, instrument)
- Configurable table of metric results
Pick metric parameter, metric (skill score) type(s), event(s). Get a table of model setting descriptions with skill scores

See Poster by Anna Chulaki for Demo & Feedback

Challenge Status Summary

- Study 1: Magnetic field at geosynchronous orbit
- Study 4: Ground magnetic perturbations*
 - Sufficient number of external submissions and CCMC runs.
 - Reports are ready (Antti Pulkinnen, Lutz Rastaetter). Ready for publication.
 - *Suggested for the Operational Metrics by NOAA SWPC (Howard Singer)
- Study 3: Plasma parameters at geosynch. orbit
 - Use pressure vs. density for comparison (Michelle Thomsen)
 - On-line tool for LANL MPA data and model output comparison is ready (Lutz)
 - MPA plasma sheet temperature/pressure should be corrected (Joe Borovsky)
- Study 2: Magnetopause crossings by geosynch. satellite
 - LANL magnetopause in/out time series are ready (Michelle Thomsen).
 - Few submissions. Need agreement on metric (skill score) type(s).

Model Setting Definitions

Model Setting ID	Model Name/Version	Max. Resolution
1_CMIT	CMIT2.0 LFM + TIEGCM	LFM (53x24x32 grid) + TIEGCM (5x5 deg)
1_LFM	LFM	0.3 Re (53x64x48 cells)
1_OPENGGCM	OpenGGCM v3.1 OpenGGCM + CTIM	0.3 Re 3M cells
1_SWMF	SWMF v2.0 BATSRUS v.7.73	0.25 Re 2M cells
1_WEIMER	Weimer 2005	
2_OPENGGCM	OpenGGCM v3.1 OpenGGCM + CTIM	0.25 Re 6.5M cells
2_SWMF	SWMF v2.0 BATSRUS v.7.73	0.25 Re 700K cells
3_SWMF	SWMF v2.3 BATSRUS v.8.01 + RCM2	0.25 Re 2M cells
4_SWMF	SWMF v2.3 BATSRUS v8.01	0.125 Re 3M cells
5_SWMF	SWMF v2.3 BATSRUS v8.01+ RCM2	0.125 Re 3M cells
6_SWMF	SWMF V.20090403, BATSRUS + RCM2	0.25 Re 900K cells