

CEDAR-GEM

Modeling Challenge at SWW-2013

Boulder, April 15, 2013
8:00 - noon

Conveners: Ja Soon Shim, Masha Kuznetsova, Barbara Emery, Aaron Ridley

Build upon GEM GGCM Challenge and CEDAR ETI Challenge
Share experience, lessons learned
Address topics of common interest,
Analyze effects of model coupling on metrics results
Develop tools & methods for further studies

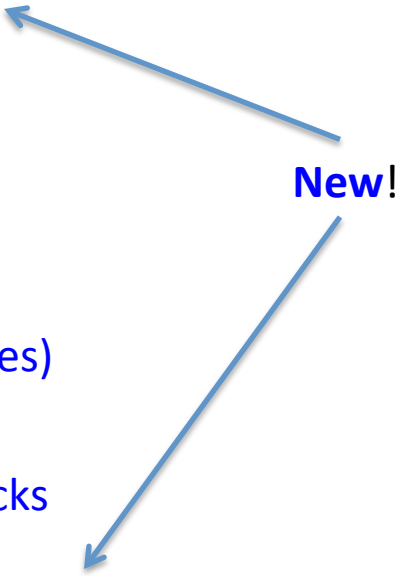
Agenda Topics for Discussion I

- Review of the first results of the study on role of drivers (8:00 – 9:15)
 - Results for Dec 2006 event/Ja Soon Shim
 - Correlation between quality of input drivers and model output (metrics study)
 - Needs for assessment of high latitude ionosphere data streams
 - GITM results for GEM-CEDAR events/Aaron Ridley
 - About event runs with AMIE/Geoff Crowley
 - More events and more measurements
- Methods and tools for MI coupling studies/CCMC, Modelers (9:15 -10:00)
 - Tools for swapping high latitude electric potential drivers
 - Particle precipitation
 - Penetration electric field/Mihail Codrescu, Naomi Maruyama, Gang Lu
 - Action plan for development of swapping tools

Topics for Discussion II

- Model-Data comparison (10:00 -11:00)
 - How to quantify storm impact on the ionosphere and thermosphere/
Tim Fuller-Rowell
 - Suitable metrics for validation of IT parameters for different
applications/Tim Fuller Rowell, Masha Kuznetsova
- Climatology project (11:00 – 11:20)
 - Status, lessons learned and future plans/Barbara Emery
- Ideal for real-time validation (11:20 – 11:45)
 - NASA missions needs. Ne and Te at ISS/Masha Kuznetsova, Mihail
Codrescu
 - Other ideas
- Planning of future activities (11:45 – noon)
 - Plans for Summer GEM-CEDAR & CEDAR Workshops
 - Action items

Physical Parameters

- Ionosphere/Thermosphere models or coupled model components:
 - Vertical and horizontal drifts at Jicamarca
 - Neutral density at CHAMP orbit
 - Electron density at CHAMP orbit
 - NmF2 and HmF3 from LEO satellites (CHAMP and COSMIC) and ISRs
 - Temperature T_n and neutral winds at 250 km (FP Spectrometer, Arrival height, Resolute Bay)
 - Ne, Te, Ti, Ion vert velocity at 300 km (Millstone Hill, Sondrestrom, EISCAT, Svalbard ISRs)
 - Geospace models or coupled model components:
 - Magnetic field at geosynchronous orbit
 - Ground magnetic perturbations
 - Dst index
 - Auroral oval position (high latitude and low latitude boundaries)
 - Parameters along DMSP tracks
 - Poynting flux (Joule heating) into ionosphere along DMSP tracks
 - Plasma Velocity (V_x - along track, V_y cross track, V_z - vertical)
 - Additional time series in support of simulation results analysis
 - Cross polar cap potential (northern and southern hemisphere)
 - Joule heating (or Poynting flux) integrated over each hemisphere.
- 
- New!**

Events

- Short events

- December 14, 2006 12:00 UT - December 16, 00:00 UT
- August 31, 2001 00:00 UT - September 1, 00:00 UT
- August 31, 2005 10:00 UT - September 1, 12:00 UT
- May 15, 2005 00:00 UT - May 16, 2005, 00:00 UT
- July 9, 2005 00:00 UT - July 12, 2005, 00:00 UT

- Climatology projects

- March 2007 – March 2008 (quiet, ISR observations)
- March 2005 – Sept 2005 (disturbed, Dst study)



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<http://ccmc.gsfc.nasa.gov/challenges/>

GEM-CEDAR Challenge



[Challenge home](#) | [Selected events](#) | [Selected parameters](#) | [GEM-CEDAR metrics suite](#) | [CCMC](#)

GEM-CEDAR Metrics Suite

Simulation results submission interface:

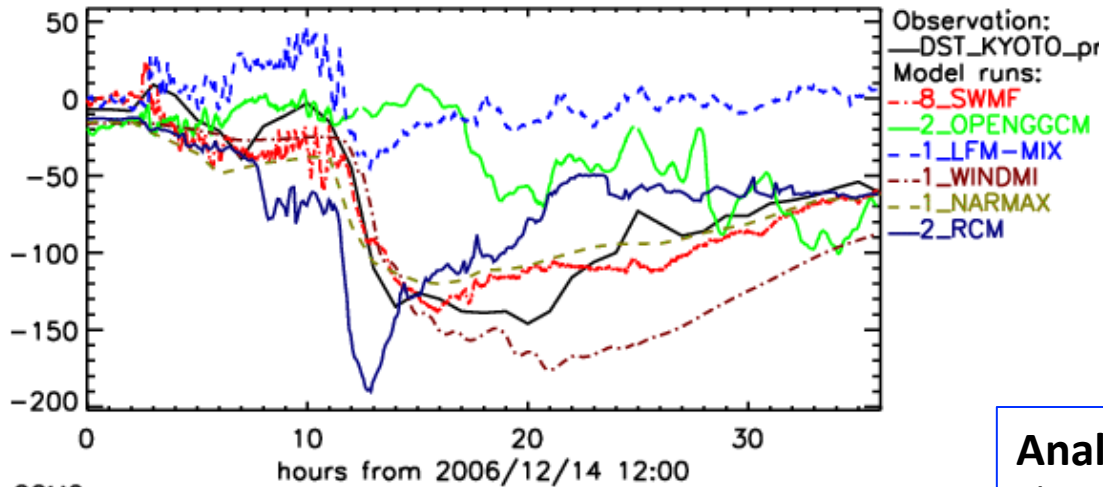
- Prior to submission of your simulation results please review:
[Selected events](#) | [Physical parameters](#) | [Model output file format](#)
- **[Submit your simulation results >>](#)**

Simulation results analysis tools:

- [Time series plotting tool >>](#)
- [Runs for metric studies performed at the CCMC](#)

Supported by Community Coordinated Modeling Center

DST from observatory file: DST_KYOTO_provisional_E2.txt



Plot: CCMC

Analysis options:

- Show scores (several types)
- Score by location
- Time averaging
- ASCII download

Select model settings

<input type="checkbox"/>	magenta	solid	1_SWMF: BATSUS 7.73, 2M cells, CCMC	<input type="checkbox"/>	dark magenta	solid	1_RAMSCB: RAM-SCB stand-alone driven by LANL particle obser
<input type="checkbox"/>	magenta	dotted	2_SWMF: BATSUS 7.73, 700k cells (real-time)	<input type="checkbox"/>	dark magenta	dotted	2_RAMSCB: RAM-SCB stand-alone driven by LANL particle obser
<input type="checkbox"/>	magenta	dashed	3_SWMF: BATSUS 8.01 with RCM, 2M cells,	<input type="checkbox"/>	dark magenta	dashed	3_RAMSCB: RAM-SCB stand-alone driven by LANL particle obser
<input type="checkbox"/>	magenta	dash-dotted	4_SWMF: BATSUS 8.01, 3 M cells, CCMC	<input type="checkbox"/>	dark red	dotted	1_BFM92: Burton (1975) Feldstein (1992) and Murayama (1982)
<input type="checkbox"/>	red	solid	5_SWMF: BATSUS 7.73, 2M cells, CCMC	<input checked="" type="checkbox"/>	dark red	dash-dotted	1_WINDMI: WINDMI-1.0-nominal, rectified solar wind driver
<input type="checkbox"/>	red	dotted	6_SWMF: BATSUS 7.73, 700k cells (real-time)	<input type="checkbox"/>	dark green-yellow	solid	2_WINDMI: WINDMI-1.0-nominal, Siscoe solar wind driver
<input type="checkbox"/>	red	dashed	7_SWMF: BATSUS 8.01 with RCM, 2M cells,	<input type="checkbox"/>	dark green-yellow	dotted	3_WINDMI: WINDMI-1.0-nominal, Newell solar wind driver
<input checked="" type="checkbox"/>	red	dash-dotted	8_SWMF: BATSUS 8.01, 3 M cells, CCMC	<input checked="" type="checkbox"/>	dark green-yellow	dashed	1_NARMAX: UOS-NARMAX-HW - NARMAX polynomial derivati
<input type="checkbox"/>	yellow	dashed	1_OPE: UOS-OPENVIS - OPENVIS polynomial derivative	<input type="checkbox"/>	dark green-yellow	dash-dotted	2_NARMAX: UOS-NARMAX-RJB - NARMAX polynomial derivat
<input checked="" type="checkbox"/>	green	solid	2_OPE: UOS-OPENVIS - OPENVIS polynomial derivative	<input type="checkbox"/>	dark green	solid	1_RiceDst: Rice Univ. Dst model - neural network using Boyle 199
<input checked="" type="checkbox"/>	blue	dashed	1_LFM: LFM-MIX - LFM-MIX polynomial derivative	<input type="checkbox"/>	dark green	dotted	1_RCM: Rice Convection Model, Hilmer and Voigt (1995) magneti
<input type="checkbox"/>	grey	dash-dotted	1_IRF: IRF - IRF polynomial derivative	<input checked="" type="checkbox"/>	dark blue	solid	2_RCM: Rice Convection Model, Hilmer and Voigt (1995) magneti
				<input type="checkbox"/>	dark cyan	dotted	1_RDST: RDST (real-time analysis of magnetometer data) version