



CCMC-VMR Partnership

<http://vmr.engin.umich.edu/>

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April 2, 2014



Virtual Model Repository

- The VMR is a virtual observatory that enables scientific analysis of numerical model results. A variety of model results are made available in a consistent and intuitive way through visualization tools and data/model comparisons. Open access to most model output is provided.
- The VMR enables browse/search of model output and satellite data for time periods of scientific interest. Data discovery and exchange is coordinated through various APIs from multiple sites to bring in the relevant data for visualization.
- Collaborate by sharing plots and movies or commenting in run wikis.



What's in the VMR?

- Models
 - CCMC event runs
 - SWMF runs at Michigan
 - GITM
 - HEIDI
 - AMIE
 - IRI (from CCMC)
- Data
 - Kyoto Dst
 - SWPC F10.7
 - CDAWeb
 - Madrigal (CEDAR)
 - DMSP
 - Magnetospheric satellite magnetic field plotting



CCMC Collaboration

- We have a long history of collaboration between Michigan and the CCMC, going back to 2000.
- The CCMC has the largest collection of model output, and was the first group the VMR collaborated with when it was created.
- The VMR mostly interacts with “event” data for Earth’s global magnetosphere runs, though it is also using other CCMC resources (ie. IRI runs).



VMR Homepage

The VMR homepage allows you to quickly get to the information you want. You can filter the search by date, data type, and region of space, or just jump to a specific type of data and refine the search further there.

VMR - VIRTUAL MODEL REPOSITORY

Welcome to the Virtual Model Repository at the University of Michigan.

VMR Goals:

- Make computational model results available to the general community
 - Enable search tools to help discover model runs
 - Provide consistent visualization of model results
 - Allow independent interpretation of published model findings
- Provide intuitive data-model comparisons
 - Get data from various sites, including other Virtual Observatories (VxOs)
 - Get model results from the CCMC, UM, and other sites
- Enable open access to model output used in support of published papers.

Follow the link below to begin your search data and models, and the next page will assist in nar

- [Search for DATA and MODELS](#)

You can also jump directly to the individual model or data page in the VMR:

[VMR Help](#) | [Publications & Presentations](#) | [Downloads](#) | [Other VxOs](#)

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VMR - VIRTUAL MODEL REPOSITORY

search by:

DATE:
 DATA TYPE:
 REGION OF SPACE:

Search Criteria

DATE = 2000

Search Results

Data

[View](#) F10.7 results for selected search.

[View](#) Kyoto Dst results for selected search.

[View](#) CDAWeb results for selected search.

[Go to](#) Satellite magnetic field plotting. [[view](#)/[hide](#) details]

[Plot](#) Geotail

[Plot](#) GOES-8

[Plot](#) GOES-10

[Plot](#) Polar

[Plot](#) Wind

[Plot](#) IMP-8

Models

[View](#) HEIDI results.

[View](#) AMIE results.

[View](#) CCMC magnetosphere event run results.

[View](#) SWMF magnetosphere run results.

[Run](#) IRI.

[View](#) list of data currently included in the VMR.
[View](#) list of models currently included in the VMR.

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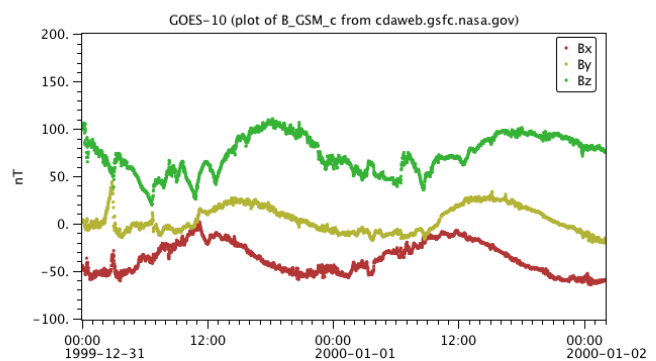
DATA: satellite magnetic field

Visualization of magnetic field data from many satellites is provided, with instructions to use autoplot.

Satellite Magnetic Field Data Plots

Geotail View plot	GOES-8 View plot
GOES-9 View plot	GOES-10 View plot
GOES-11 View plot	GOES-12 View plot
Polar View plot	Wind View plot
Cluster-1 View plot	Cluster-2 View plot
Cluster-3 View plot	Cluster-4 View plot
IMP-8 View plot	Themis-A View plot
Themis-B View plot	Themis-C View plot

Plot of GOES-10 data



To make a similar plot yourself that you can modify further, paste the line below into [autoplot](#) yourself.
 vap:ftp://cdaweb.gsfc.nasa.gov/pub/data/goes/goes10/mag_k0/Y/g0_k0_mag_%Y%m%d_v...cdf?B_GSM_c&timerange=1999-12-31+through+2000-01-02
 You can also download [this](#) file and load it into [autoplot](#).

Enter your own date/time range to view satellite data:

Enter date and time as YYYY-MM-DD / HH:MM:SS data range: 1999-03-21 - 2006-07-22

Begin: /

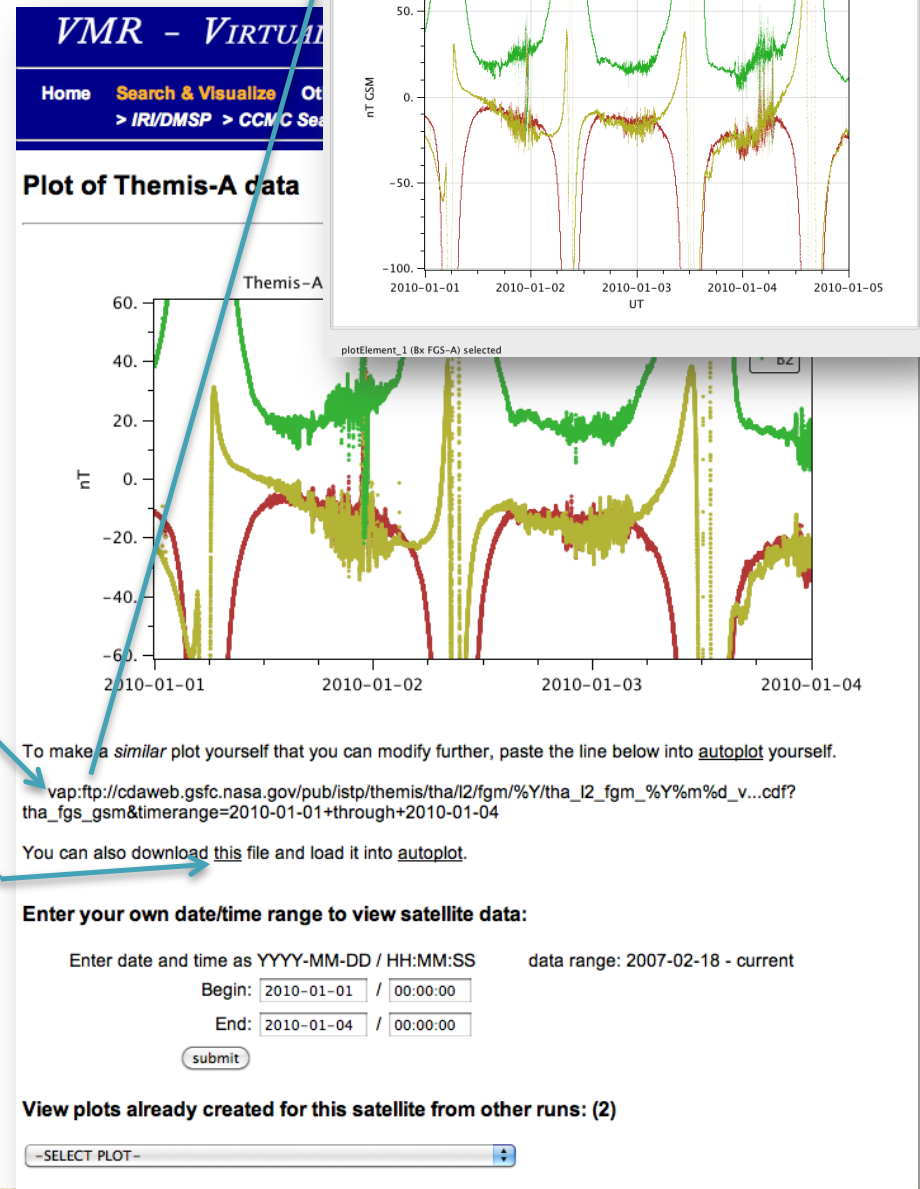
End: /

View plots already created for this satellite from other runs: (3)

NOTE: If your plot says 'no data set' in the upper left corner, then there is likely a gap in the data available from cdaweb for the time period selected. Date coverage available, but not for gaps in availability. That feature will be added at some point.

Customize your plot

- Many plots are now created with autoplot (<http://autoplot.org>)
 - You can take the custom URL and view the data yourself.
 - You can also download the .vap file and load it into autoplot to then further customize the plot yourself.



VMR - VIRTUAL
 Home Search & Visualize Other
 > IRI/DMSP > CCMC Search

Plot of Themis-A data

Themis-A

Autoplot interface showing a plot of FGS magnetic field B in XYZ GSM Coordinates. The plot displays three data series: Bx FGS-A (red), By FGS-A (green), and Bz FGS-A (yellow). The y-axis is labeled 'nT GSM' and ranges from -100 to 100. The x-axis is labeled 'UT' and ranges from 2010-01-01 to 2010-01-05. A menu bar at the top includes File, Edit, View, Options, Bookmarks, Tools, and Help. A toolbar below the menu bar includes canvas, axes, style, layout, data, metadata, and script.

To make a *similar* plot yourself that you can modify further, paste the line below into [autoplot](http://autoplot.org) yourself.

`vap:ftp://cdaweb.gsfc.nasa.gov/pub/istp/themis/tha/l2/fgm/%Y/tha_l2_fgm_%Y%m%d_v...cdf?tha_fgs_gsm&timerange=2010-01-01+through+2010-01-04`

You can also download [this](#) file and load it into [autoplot](http://autoplot.org).

Enter your own date/time range to view satellite data:

Enter date and time as YYYY-MM-DD / HH:MM:SS data range: 2007-02-18 - current

Begin: /

End: /

View plots already created for this satellite from other runs: (2)

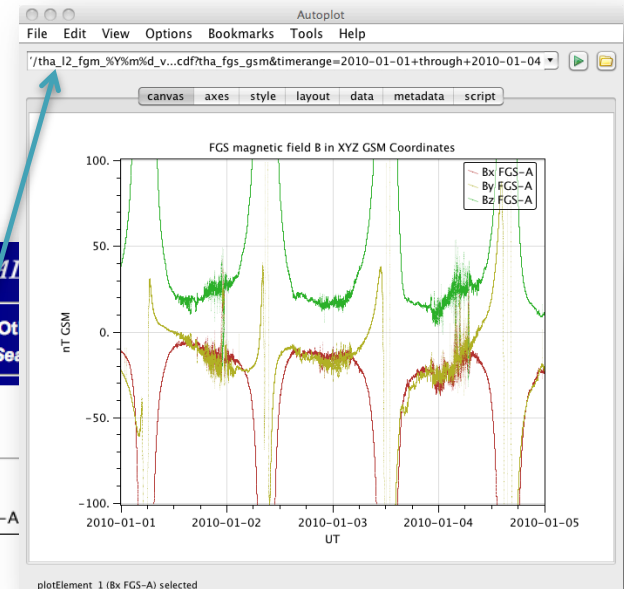
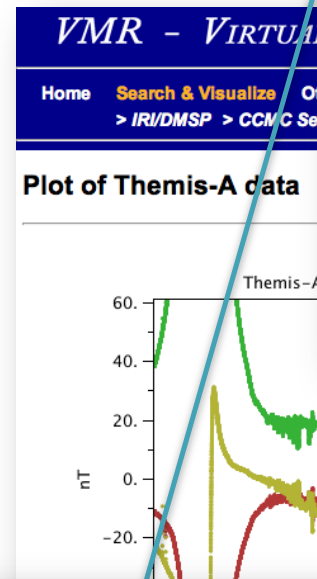
--SELECT PLOT--

NOTE: If your plot says 'no data set' in the upper left corner, then there is likely a gap in the data available from cdaweb for the time period selected. Date correction is made for the range of dates available, but not for gaps in availability. That feature will be added at some point.



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`vap:ftp://cdaweb.gsfc.nasa.gov/pub/istp/themis/tha/l2/fgm/%Y/tha_l2_fgm_%Y%m%d_v...cdf?tha_fgs_gsm&timerange=2010-01-01+through+2010-01-04`

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Enter your own date/time range to view satellite data:

Enter date and time as YYYY-MM-DD / HH:MM:SS

data range: 2007-02-18 - current

Begin: 2010-01-01 / 00:00:00

End: 2010-01-04 / 00:00:00

submit

View plots already created for this satellite from other runs: (2)

--SELECT PLOT--

NOTE: If your plot says 'no data set' in the upper left corner, then there is likely a gap in the data available from cdaweb for the time period selected. Date correction is made for the range of dates available, but not for gaps in availability. That feature will be added at some point.



CCMC

The Community Coordinated Modeling Center is a great resource for its run-on-request model collection. CCMC has visualization tools to view the model results, but few tools for data/model comparisons. The CCMC website links to the VMR for that capability.

COMMUNITY COORDINATED MODELING CENTER

Related Links | Frequently Asked Questions | Community Feedback | Downloads | Sitemap

About | Models at CCMC | Request A Run | View Results | Instant Run | Metrics and Validation | Education | R2O Simulations | Mission Support

CCMC Models at a Glance

The CCMC hosts a variety of models covering the entire domain from the solar corona to the Earth's upper atmosphere. We work with model developers to make their models available to a wide research community through the following services.

- [Runs on Request](#)
- [Instant Run](#)

SOLAR/HELIO Model Users - Please Read the announcement regarding CORHEL V4.2, a new version that supports two coronal models (MAS and a new CORHEL implementation of the Wang-Sheeley-Argé method) and two Heliospheric (MAS and ENLIL) and offers six possible model combinations. It works with synoptic magnetograms from six different observatories.

Coordinate Transformation Services

[ModelWeb Catalog and Archive](#)

[LWS Supported Tools and Methods](#)

[Rules of the Road](#) for model developers interested in submitting their model to the CCMC.

SOLAR MODELS

HELIOSPHERE MODELS

MAGNETOSPHERE MODELS

IONOSPHERE / THERMOSPHERE MODELS

NASA

Curator: Anna Chulaki | NASA Official: Dr. Masha Kuznetsova | | Privacy, Security Notices



CCMC: run catalog

The Earth magnetosphere event run catalog at CCMC is searchable in the VMR.

VMR - VIRTUAL MODEL REPOSITORY
HOME

[solar](#)
[heliosphere](#)
[magnetosphere](#)
[inner magnetosphere](#)
[ionosphere/thermosphere](#)

Search NASA's Community Coordinated Modeling Center (CCMC) Runs-On-Request Magnetosphere Event Runs

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Run Name: <input type="text" value="SWPC"/>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">select</th> <th style="width: 40%;">model</th> <th style="width: 10%;">event date</th> <th style="width: 10%;">run ID</th> <th style="width: 10%;">E10.7</th> <th style="width: 10%;">3D files</th> </tr> </thead> <tbody> <tr> <td>select</td> <td>SWPC_OpenGGCM_022712_8</td> <td>OpenGGCM 4.0</td> <td>August 5, 2011</td> <td>6757</td> <td>113 1801</td> </tr> <tr> <td>select</td> <td>SWPC_OpenGGCM_022712_7</td> <td>OpenGGCM 4.0</td> <td>April 4, 2010</td> <td>6756</td> <td>79 1621</td> </tr> <tr> <td>select</td> <td>SWPC_OpenGGCM_031111_4</td> <td>OpenGGCM 4.0</td> <td>August 30, 2005</td> <td>6755</td> <td>86 1861</td> </tr> <tr> <td>select</td> <td>SWPC_OpenGGCM_031111_3</td> <td>OpenGGCM 4.0</td> <td>August 30, 2001</td> <td>6754</td> <td>203 1741</td> </tr> <tr> <td>select</td> <td>SWPC_OpenGGCM_031111_2</td> <td>OpenGGCM 4.0</td> 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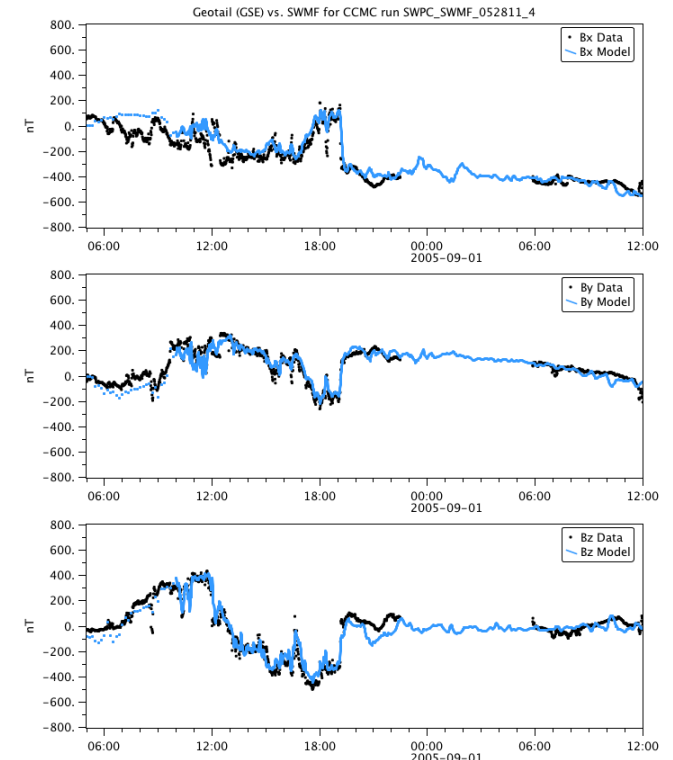


CCMC: data/model plotting

View a specific run and you can see the satellite extractions made from the model output and make the data/model comparisons. You can also view other model variables.

VMR - VIRTUAL MODEL REPOSITORY

Plot of CCMC event run SWPC_SWMF_052811_4
SWMF run vs. Geotail data for 2005-08-31 05:00:00 to 2005-09-01 12:00:00



You can download [this](#) file and load it into [autoplot](#) to make further modifications.

NOTE: If there is no model values on the plot, then it is likely that the satellite position is outside of the modeled region. View the satellite position and the modeled time.

VMR - VIRTUAL MODEL REPOSITORY

Detail view for CCMC event run SWPC_SWMF_052811_4

Satellite Data Available	Data-Model Comparison	Model on Satellite Track	Run information:																																																																																																																		
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Would you like to see other CCMC model runs that have a time overlap with this run? [\[Yes / No\]](#)



[return](#)

Detail view for CCMC event run SWPC_SWMF_030311_1a

Satellite Data Available		Data-Model Comparison		Model on Satellite Track		Run information:	
Satellite		Satellite		Satellite		View run at CCMC site.	
Cluster-1	N/A	Cluster-1		Cluster-1	plot model	Event Date	October 29 2003
Cluster-2	N/A	Cluster-2		Cluster-2	plot model	Start Time	2003/10/29 01:00
Cluster-3	N/A	Cluster-3		Cluster-3	plot model	End Time	2003/10/30 06:00
Cluster-4	N/A	Cluster-4		Cluster-4	plot model	Key Words	dB/dt R2O Challenge 2011
GOES-8	N/A	GOES-8		GOES-8	plot model	Model	SWMF
GOES-9	N/A	GOES-9		GOES-9	plot model	Model Version	v20110131
GOES-10	plot B data plot B data +/-1 day	GOES-10	view B	GOES-10	plot model	Validation Level	0
GOES-11	N/A	GOES-11		GOES-11	plot model	Coordinate System for Input	GSM
GOES-12	plot B data plot B data +/-1 day	GOES-12	view B	GOES-12	plot model	Coordinate System for Output	GSM
Geotail	plot B data plot B data +/-1 day	Geotail	plot B	Geotail	plot model	Dipole Tilt, in the X-Z Plane, at Start deg	-20.20
IMP-8	N/A	IMP-8		IMP-8	plot model	Dipole Tilt, in Y-Z GSE plane, deg	-10.20
Polar	plot B data plot B data +/-1 day	Polar	plot B	Polar	plot model	Update Dipole Orientation with Time	yes
Wind	plot B data plot B data +/-1 day	Wind		Wind		Inflow Boundary R_E	32
						F10.7	275
						Conductance Model	auroral
						Corotation	yes
						Run Number	SWPC_SWMF_030311_1a
						3D files saved	1471

Would you like to see other CCMC model runs that have a time overlap with this run? [\[Yes / No\]](#)

Other runs that have a time overlap with this run:

run	GOES-10	GOES-12	Geotail	Polar
view CCMC_CCMC_110503_1				
view CCMC_CCMC_110503_2.2	x	x	x	x
view CCMC_CCMC_110503_2.3	x	x	x	x
view CCMC_CCMC_111003_1				
view weili_jiang_031012_4	x	x	x	x
view SWPC_SWMF_030311_1b	x	x	x	x
view SWPC_OpenGGCM_031111_1	x	x	x	x
view SWPC_CMIT-LFM-MIX_031711_1	x	x	x	x
view SWPC_SWMF_030311_1	x	x	x	x
view GEM2008_CHALLENGE_061410_1				
view CCMC_CCMC_040209_1				
view CCMC_CCMC_122408_1				
view CCMC_CCMC_123008_1				
view CCMC_CCMC_102708_1	x	x	x	x
view ccmc_ccmc_082208_1	x	x	x	x
view CCMC_CCMC_082808_2b				
view ccmc_ccmc_082208_1a	x	x		
view Tony_Mannucci_032408_1	x	x	x	x
view Nishu_Karna_042212_1	x	x	x	x
	plot	plot	plot	plot

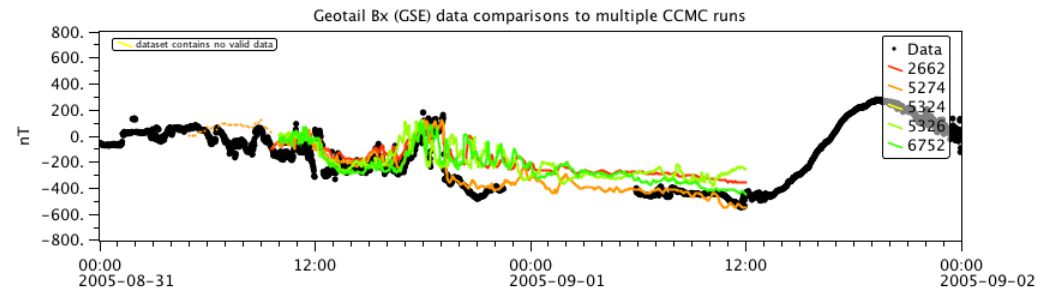
CCMC: multiple run comparison

- You can now compare multiple runs with data including RMS errors.
- You can also load the data into autoplot to make more detailed analysis.

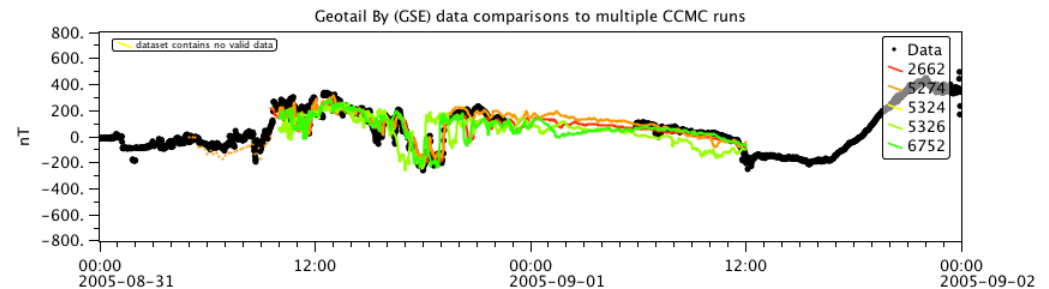
VMR - VIRTUAL MODEL REPOSITORY

Plot of multiple CCMC event runs with Geotail data for 2005-08-31 through 2005-09-01

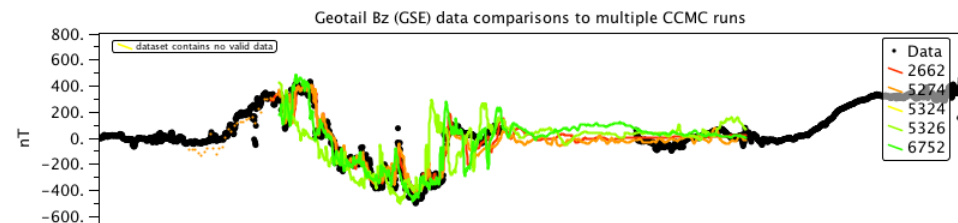
	RMS Error	Bx	By	Bz
2662 = CCMC_CCMC_082808_4a		39%	49%	62%
5274 = SWPC_SWMF_052811_4		14%	45%	66%
5324 = SWPC_CMIT-LFM-MIX-TIEGCM_031711_3		-	-	-
5326 = SWPC_CMIT-LFM-MIX_031711_4		43%	78%	132%
6752 = SWPC_CMIT-LFM-MIX-TIEGCM_031711_4		26%	43%	78%



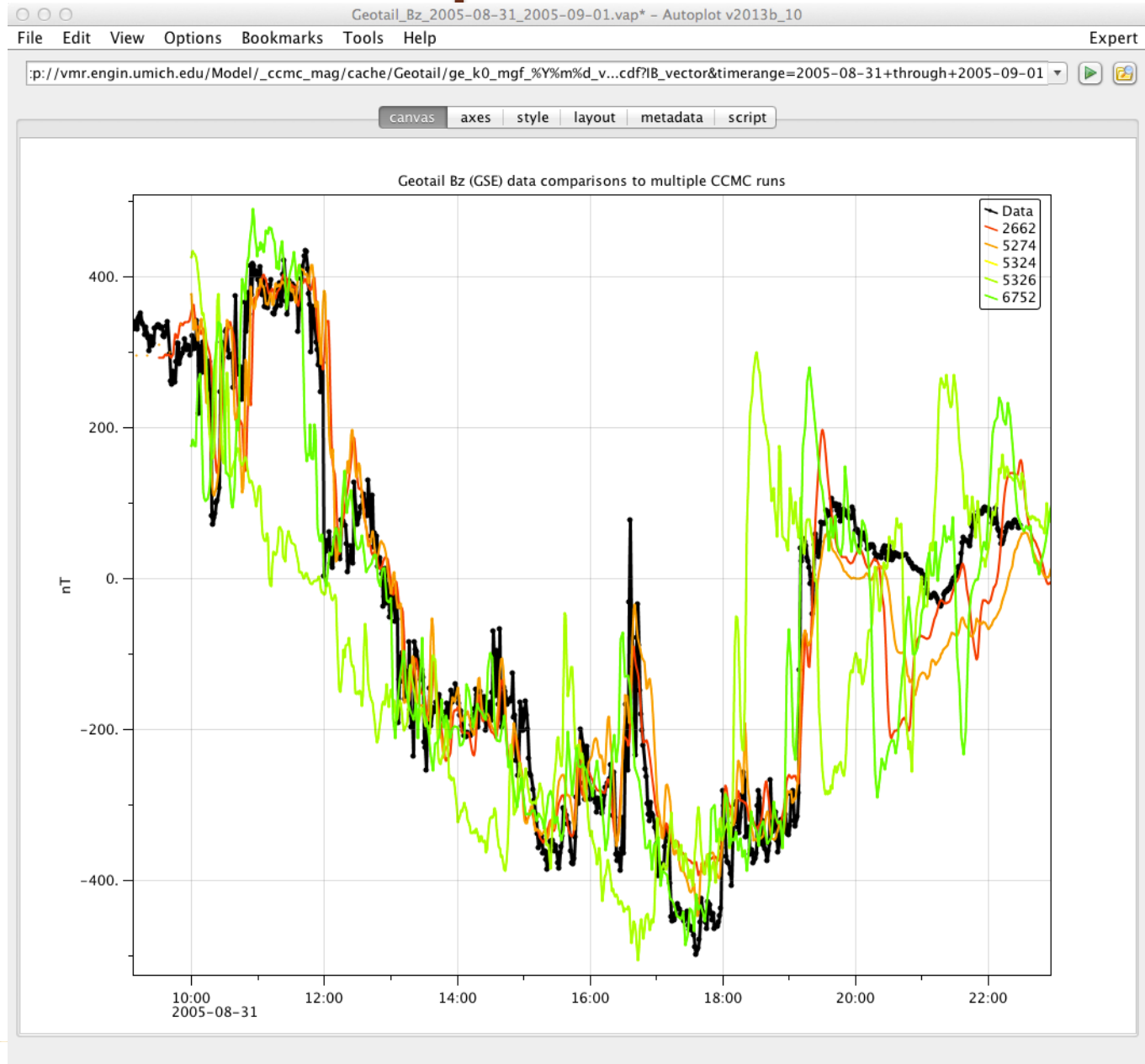
You can download [this file](#) and load it into [autoplot](#) to make further modifications.



You can download [this file](#) and load it into [autoplot](#) to make further modifications.



CCMC: multiple run detail





CCMC: scripts find glitches

- The more you use automated scripts to process and use the data products, the more small errors you will find.
- Errors such as missing files, NaNs, incorrect date formats, etc. will cause scripts to die.
- The VMR is working to report these glitches, and this has led to more consistent and accurate data products from the CCMC.



Collaborative Tools

Timelines are a new tool under development.

VMR - VIRTUAL MODEL REPOSITORY [HOME](#)

Timeline for: PINOT-1 [return to timelines](#)

The timeline displays events from November 16 to 26, 2013. The x-axis shows hours from 6hr to 17hr. Events include:

- Nov 16: Pulsating Aurora (6hr)
- Nov 17: Pulsating Aurora (7hr)
- Nov 18: Pulsating Aurora (8hr), Streamers (8hr), Substorm Onsets (8hr)
- Nov 19: Pulsating Aurora (9hr), Substorm Onsets (9hr)
- Nov 20: Pulsating Aurora (10hr), Substorm Onsets (10hr)
- Nov 21: Pulsating Aurora (11hr), Streamers (11hr), Streamers (11hr)
- Nov 22: Pulsating Aurora (12hr), Streamers (12hr), Pulsating Aurora (12hr), Streamers (12hr), Streamers (12hr), Streamers (12hr), Substorm Onsets (12hr)
- Nov 23: Pulsating Aurora (13hr), Substorm Onsets (13hr)
- Nov 24: Pulsating Aurora (14hr), Streamers (14hr), Pulsating Aurora (14hr), Streamers (14hr), Streamers (14hr)
- Nov 25: Pulsating Aurora (15hr), Streamers (15hr)
- Nov 26: Pulsating Aurora (16hr)

Add an event to this timeline

Event Category: enter new category:

Start (required) End (optional) both entered as YYYYMMDDHHMM

Short description:

[VMR Help](#) | [Publications & Presentations](#) | [Downloads](#) | [Other VxOs](#)

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Collaborative Tools

Scroll in time, click on an item, go to plot or wiki page.

VMR - VIRTUAL MODEL REPOSITORY [HOME](#)

Timeline for: PINOT-1 [return to timelines](#)

Timeline © SIMILE

Add an event to this timeline

Event Category: enter new category:

Start (required) End (optional) both entered as YYYYMMDDHHMM

Short description:

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Collaborative Tools

Wiki page enables open comment and discussion.

A screenshot of a MediaWiki page titled "VMR wiki". The page content is as follows:

Trace: [swpc_swmf_030311_1](#) • [20121107_1100pulsatingaurora](#)

pinot-test:20121107_1100pulsatingaurora

Pulsating Aurora

start time = "Nov 07 2012 11:00:00 GMT"

end time = "Nov 07 2012 15:00:00 GMT"

Incoherent Scatter Radar Data

- [PFISR data for this time](#)
- [RISR data for this time](#)

Neutral Wind Data

A list of SDI data that might exist (Please note that these links go to the month summary, since this is the best place to land users):

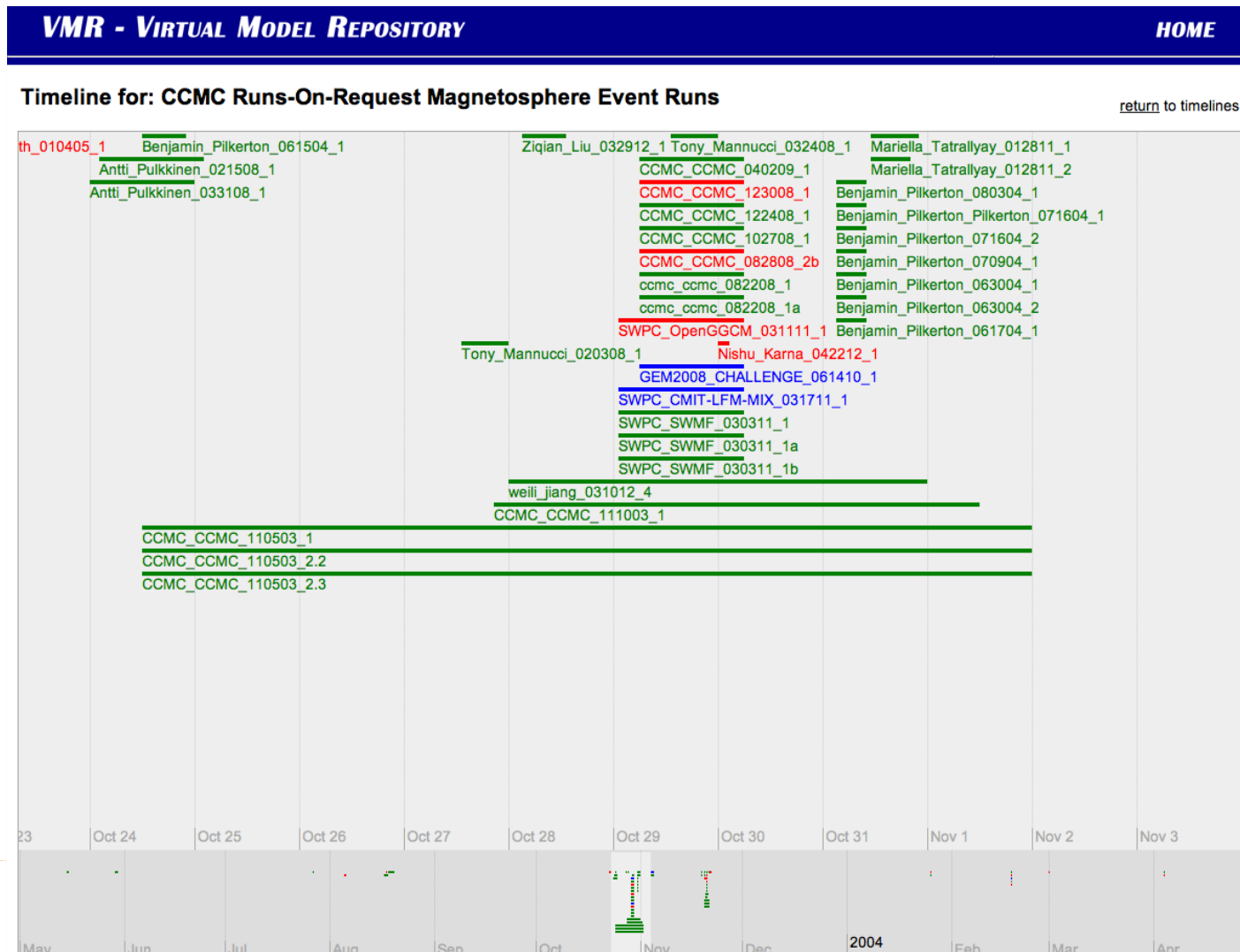
- [Poker_Flat SDI Data for wavelength 6300](#)
- [Poker_Flat SDI Data for wavelength 5577](#)
- [Poker_Flat SDI Data for wavelength 5890](#)
- [HAARP SDI Data for wavelength 6300](#)
- [HAARP SDI Data for wavelength 5577](#)
- [HAARP SDI Data for wavelength 5890](#)
- [Mawson SDI Data for wavelength 6300](#)
- [Mawson SDI Data for wavelength 5577](#)
- [Mawson SDI Data for wavelength 5890](#)
- [Toolik_Lake SDI Data for wavelength 6300](#)
- [Toolik_Lake SDI Data for wavelength 5577](#)
- [Toolik_Lake SDI Data for wavelength 5890](#)

The screenshot also shows a search bar, navigation links (Recent changes, Media Manager, Sitemap), and a sidebar with icons for search, history, and discussion.



Collaborative Tools

The timeline tool is a great visual way to see all of the runs at CCMC for a given time period.





Future Plans

- Timeline and wiki tools are a big focus and will see active testing from Cassini and Rosetta missions this summer.
- Comparing multiple runs with data, including RMS errors, will continue to be developed and improved.
- We will be working with the CCMC to make heliospheric model output available with data/model visualization.
- We are collaborating with Rice to make stand-alone RCM runs available through the VMR.
- The CEDAR community conducting new data/model validations and we will provide tools to support that effort.