

Comprehensive Assessment of Models and Events Based on Library Tools (CAMEL)

Framework to combine tools to perform model execution, postprocessing, and model-data comparisons.

- Extract model-data comparisons
- Data Visualization (iSWA)
- Output Data Visualization (Metrics Vis)



Existing Model-Data Comparisons

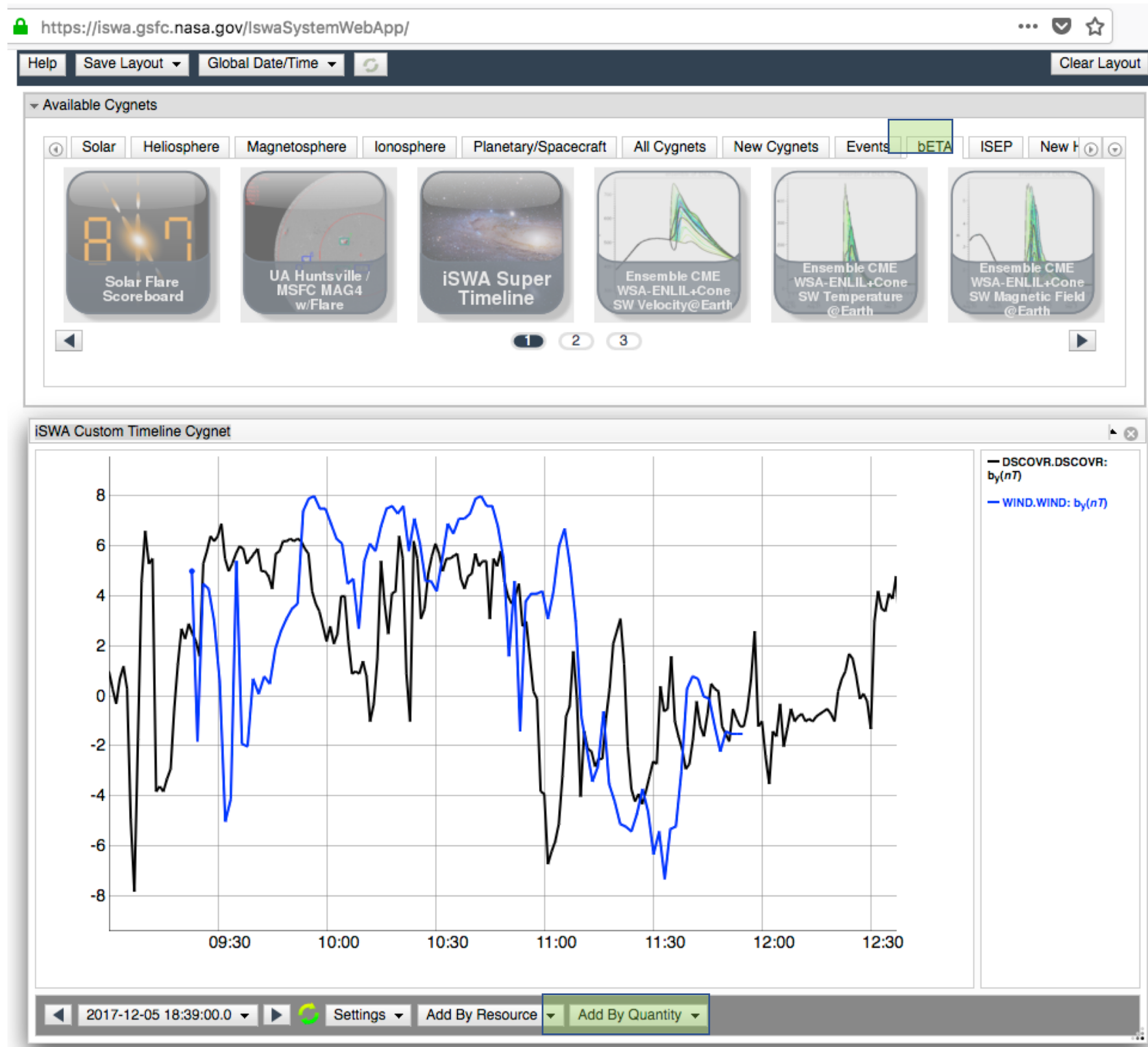
- **Virtual Model Repository** visualization Satellite tracks:
 - Tracking implemented in model (SWMF, OpenGGCM) or time series interpolations in CCMC Visualization (most 3D models)
 - Using AutoPlot
 - VMR now fully integrated on CCMC web server
- **CalcDeltaB** – magnetic perturbations on the ground (coupled magnetosphere-ionosphere models)
- **RECONX**: Separator surface between closed, open and solar wind magnetic flux
 - Visualization using Plotly application.
 - Time series of surface/separatrix distance from satellite position.
- **Time series data comparisons**
 - Time series text files from ionosphere, magnetosphere and heliosphere simulations
 - Use library of comparison metrics
 - run_metric.vis.cgi – IDL algorithms exist for wide range of scores: Root-Mean Square error, Prediction Efficiency, Event-Based skills (Probability of Detection, Prob. of False Detection, Heidke Skill)
 - Log-scale display for Ring Current/Radiation Belt fluxes – skills applied to log(flux)

Data Visualization: iSWA

Database-driven

Super Timeline supports multiple types of data

Data of same type (e.g., B_y) can come from different sources (observatory or model).



Developer: Richard Mullinix

Output Data Visualization: Metrics Vis

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 Support | Mission Support | Community Support | Tools

Data and model comparisons

This is the web interface for the visualization of observational data and results of several model run results.

Please review the default selections below and make your changes.

To start the graphics program click the *Update Plot* button. The resulting image will be displayed at this location of the page.

Should the result be a black image, then the graphics program encountered a programming error. Please report the set of input parameters used.

[Go back to metrics challenge table](#)

Update Plot will update (generate) the plot with the chosen time and plot parameters below.
This will take some time (typically 10-30s) as data are read in and processed.

Start: Year: Month: Day: Hour: Minute: Second:
to End: Year: Month: Day: Hour: Minute: Second:

Choose **Quantity** to be displayed:

Plot Options:

Image magnification

Line thickness (EPS image output only)

Character thickness (all annotations)

Thickness of Observation Data overplot (0: obs. data appears behind model results)

New: Vertical offset between data and model traces: (≠0: stack plot)

Lock plot range:
Min.: Max.:

Show scores Analysis region (by location of spacecraft):

Spectral analysis: Window Length [min]: Window overlap [%]:

Select model settings

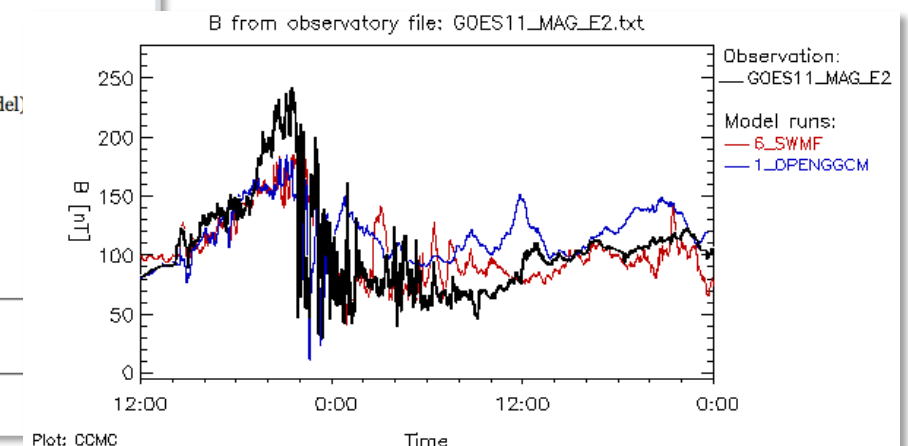
<input type="checkbox"/>	<input type="text" value="magenta"/>	<input type="text" value="solid"/>	<input type="text" value="1_SWMF: BATSUS 7.73, 2M cells, CCMC"/>
<input type="checkbox"/>	<input type="text" value="magenta"/>	<input type="text" value="dotted"/>	<input type="text" value="2_SWMF: BATSUS 7.73, 700k cells (real-time setup), CCMC"/>
<input type="checkbox"/>	<input type="text" value="magenta"/>	<input type="text" value="dashed"/>	<input type="text" value="3_SWMF: BATSUS 8.01 with RCM, 2M cells, CCMC"/>
<input type="checkbox"/>	<input type="text" value="magenta"/>	<input type="text" value="dash-dotted"/>	<input type="text" value="4_SWMF: BATSUS 8.01, 3 M cells, CCMC"/>
<input type="checkbox"/>	<input type="text" value="red"/>	<input type="text" value="solid"/>	<input type="text" value="5_SWMF: BATSUS 8.01 with RCM, 3M cells, CCMC"/>
<input checked="" type="checkbox"/>	<input type="text" value="red"/>	<input type="text" value="dotted"/>	<input type="text" value="6_SWMF: SWMF v20090403, BATSUS+RCM2, 900k cells, RT on 64 procs., A. Ridley"/>
<input type="checkbox"/>	<input type="text" value="yellow"/>	<input type="text" value="dash-dotted"/>	<input type="text" value="10a_SWMF: SWMF.v20140611, ~1 mln cells with RCM (DeltaB, Dst from SWMF model)"/>
<input type="checkbox"/>	<input type="text" value="green"/>	<input type="text" value="solid"/>	<input type="text" value="11a_SWMF: SWMF.v20140611, ~1 mln cells with RCM and new magnetic flux boundary condition at 2.5 R_E (DeltaB, Dst from SWMF Model)"/>
<input checked="" type="checkbox"/>	<input type="text" value="cyan"/>	<input type="text" value="solid"/>	<input type="text" value="1_OPENGGCM: OpenGGCM 3.1, 3 M cells, subtracted GSE_OpenGGCM dipole, added GSE dipole"/>
<input type="checkbox"/>	<input type="text" value="blue"/>	<input type="text" value="dashed"/>	<input type="text" value="2_OPENGGCM: OpenGGCM 3.1, 6.552M cells, subtracted GSE_OpenGGCM dipole, added GSE dipole"/>
<input type="checkbox"/>	<input type="text" value="grey"/>	<input type="text" value="solid"/>	<input type="text" value="3_OPENGGCM: OpenGGCM 3.1, Alexander Vapirev's submission, subtracted GSE_OpenGGCM dipole, added GSE dipole"/>
<input type="checkbox"/>	<input type="text" value="grey"/>	<input type="text" value="dash-dotted"/>	<input type="text" value="1_LFM: Michael_Wiltberger (13/11/2008,15/05/2009)"/>
<input type="checkbox"/>	<input type="text" value="dark blue"/>	<input type="text" value="dotted"/>	<input type="text" value="1_T96: Tsyganenko 1996, CCMC"/>
<input type="checkbox"/>	<input type="text" value="dark blue"/>	<input type="text" value="dashed"/>	<input type="text" value="1_T04: Tsyganenko 2004, CCMC"/>

Reset Form will reset changes to the defaults specified by the previous run of this script.

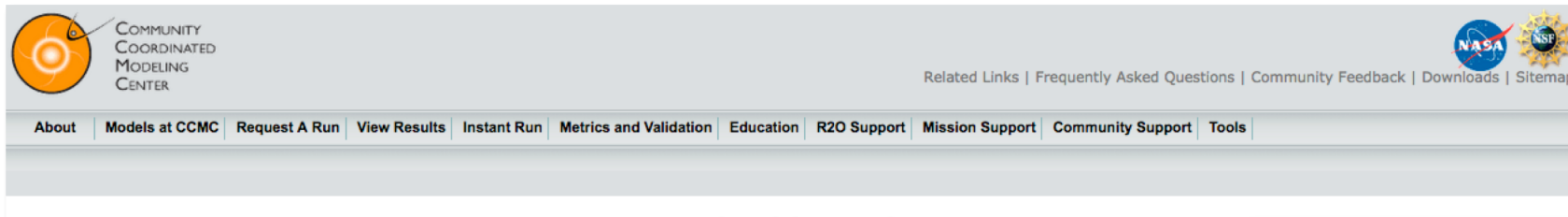
Update Plot will update (generate) the plot with the chosen time and plot parameters above.

Runs-on-Request: [Contact CCMC Staff](#)
Visualization: [Dr. Lutz Rastätter](#)

- Run_metrics_vis.cgi
 - Text file based (observations or model outputs)
 - Data organized by:
 - Campaign,
 - Metric (type of observed quantity and type of analysis),
 - Event (time interval) and
 - Observatory (spacecraft, magnetometer,...)
- In development:
 - Use iSWA database
 - Allow analysis across multiple events and observatories (e.g. latitude range of magnetometers).



Output Data Visualization: Metrics Vis



Data and model comparisons

This is the web interface for the visualization of observational data and results of several model run results.

Please review the default selections below and make your changes.

To start the graphics program click the *Update Plot* button. The resulting image will be displayed at this location of the page.

Should the result be a black image, then the graphics program encountered a programming error. Please report the set of input parameters used.

[Go back to metrics challenge table](#)

Update Plot will update (generate)

This will take some time (typically 10-30s).

Start: Year: Month: Day: Hour:

to End: Year: Month: Day: Hour:

Choose **Quantity** to be displayed:

Plot Options:

Image magnification

Line thickness (EPS image output only)

Character thickness (all annotations)

Thickness of Observation Data overplot

New: Vertical offset between data and model

Lock plot range:

Min.: Max.:

Show scores Analysis region (by location)

Spectral analysis: Window Length [min]:

Select model settings

- magenta 1_SWMF:
- magenta 2_SWMF:
- magenta 3_SWMF:
- magenta 4_SWMF:
- red 5_SWMF:
- red 6_SWMF: SWMF v20090403, BATSRUS+RCM2, 900k cells, RT on 64 procs., A. Ridley
- yellow 10a_SWMF: SWMF.v20140611, ~1 mln cells with RCM (DeltaB, Dst from SWMF model)
- green 11a_SWMF: SWMF.v20140611, ~1 mln cells with RCM and new magnetic flux boundary condition at 2.5 R_E (DeltaB, Dst from SWMF Model)
- cyan 1_OPENGGCM: OpenGGCM 3.1, 3 M cells, subtracted GSE_OpenGGCM dipole, added GSE dipole
- blue 2_OPENGGCM: OpenGGCM 3.1, 6.552M cells, subtracted GSE_OpenGGCM dipole, added GSE dipole
- grey 3_OPENGGCM: OpenGGCM 3.1, Alexander Vapirev's submission, subtracted GSE_OpenGGCM dipole, added GSE dipole
- grey 1_LFM: Michael_Wiltberger (13/11/2008,15/05/2009)
- dark blue 1_T96: Tsyganenko 1996, CCMC
- dark blue 1_To4: Tsyganenko 2004, CCMC

Reset Form will reset changes to the defaults specified by the previous run of this script.

Update Plot will update (generate) the plot with the chosen time and plot parameters above.

Runs-on-Request: [Contact CCMC Staff](#)

Visualization: [Dr. Lutz Rastätter](#)

Run_metrics_vis.cgi

- Text file based (observations or model outputs)
- Data organized by:

New Interactive data-model comparison tool in development to replace this tool.

Demonstration by Richard Mullinix

ved quantity and
and
aft,

ultiple events
atitude range of

