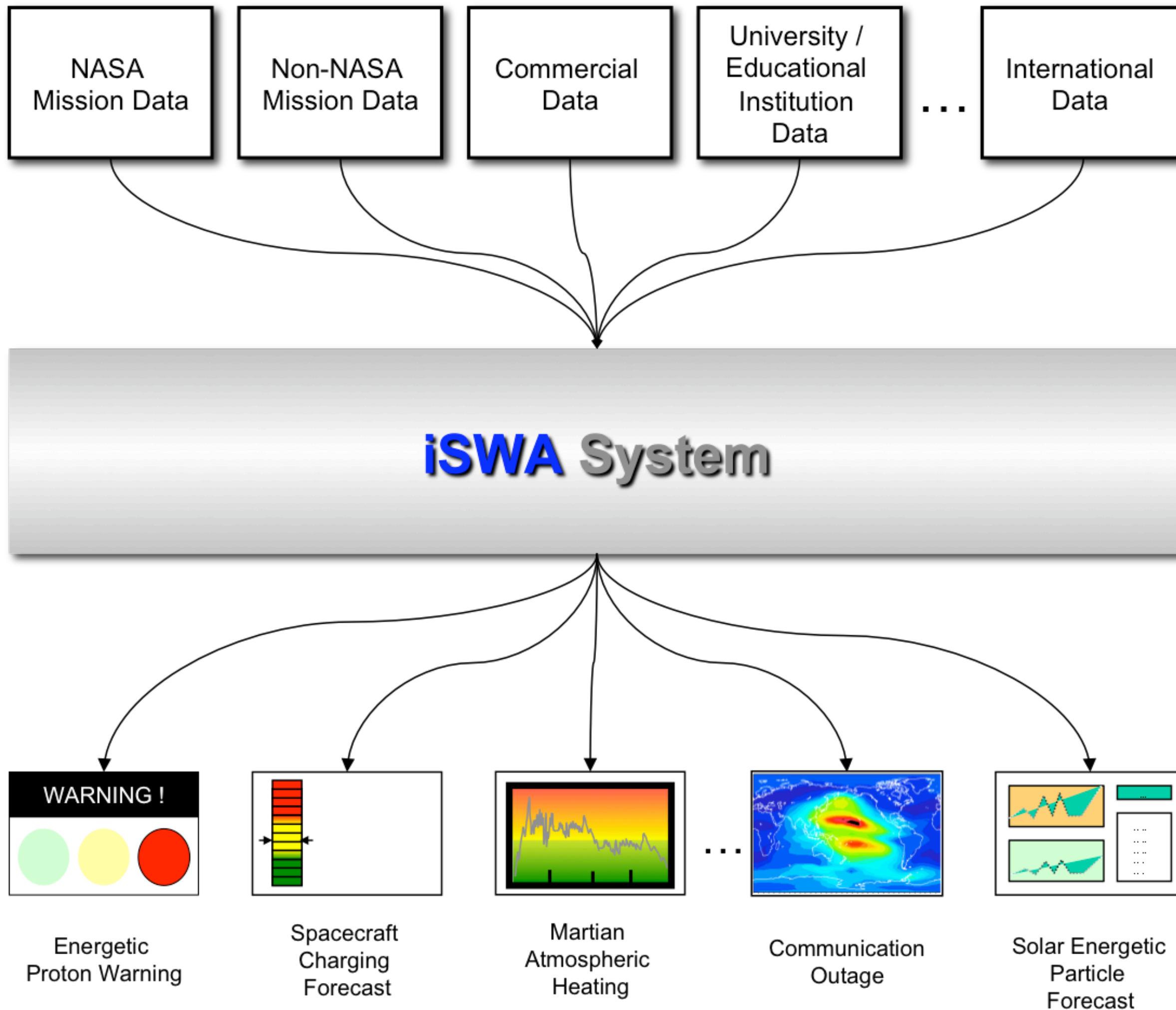




iSWA Web Services

Justin Boblitt, Richard Mullinix

iNTEGRATED SPACE WEATHER ANALYSIS SYSTEM

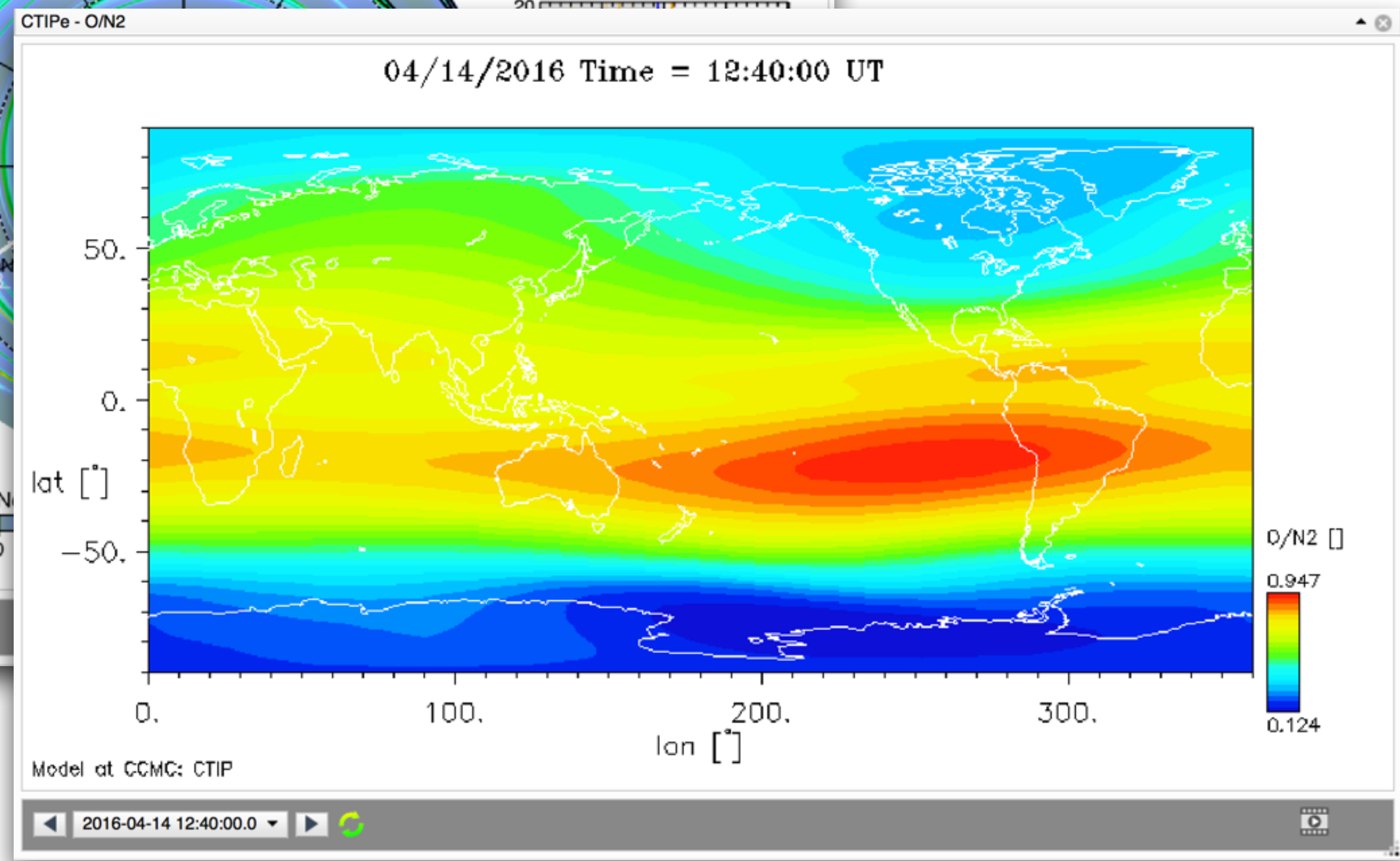
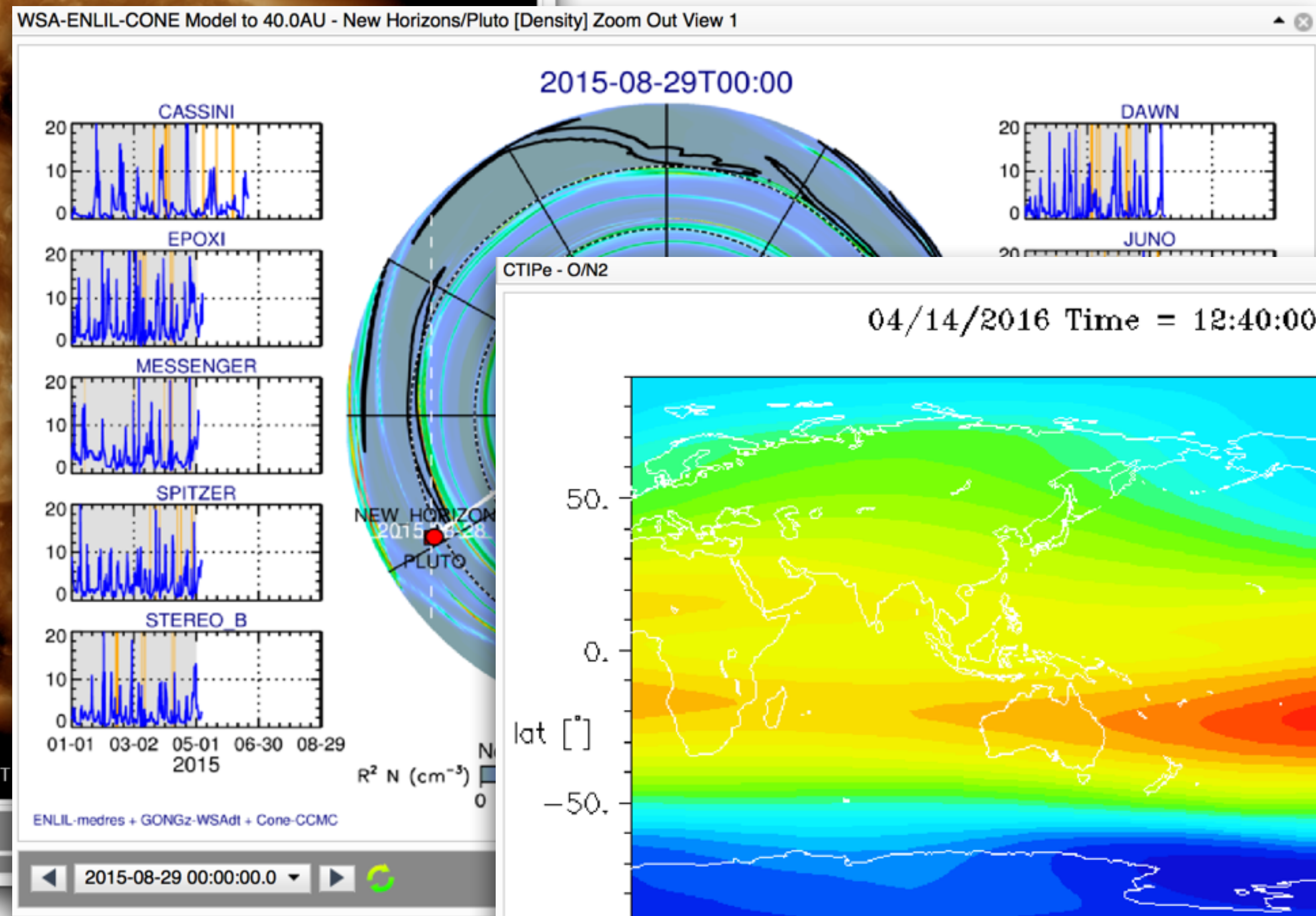
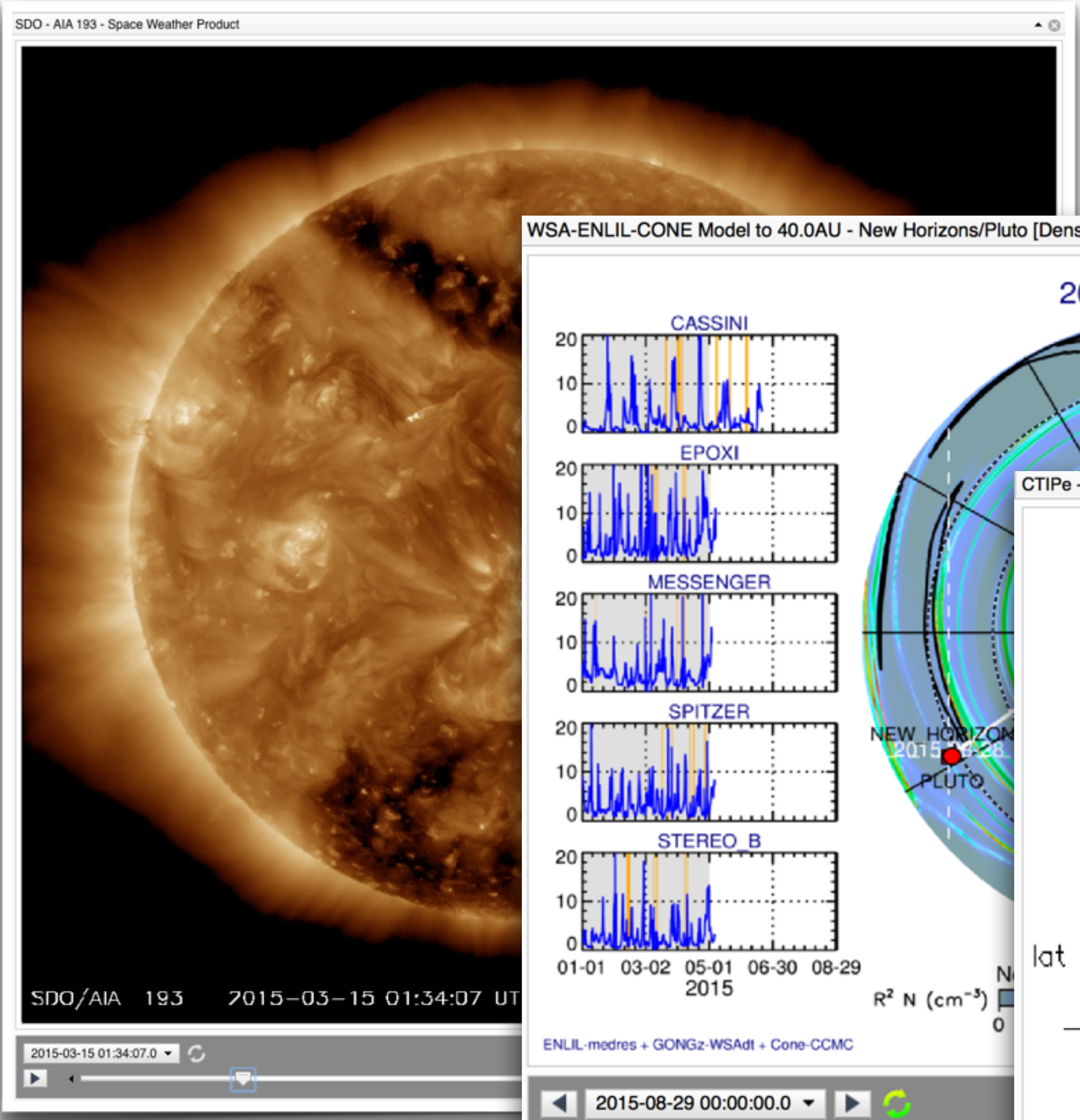


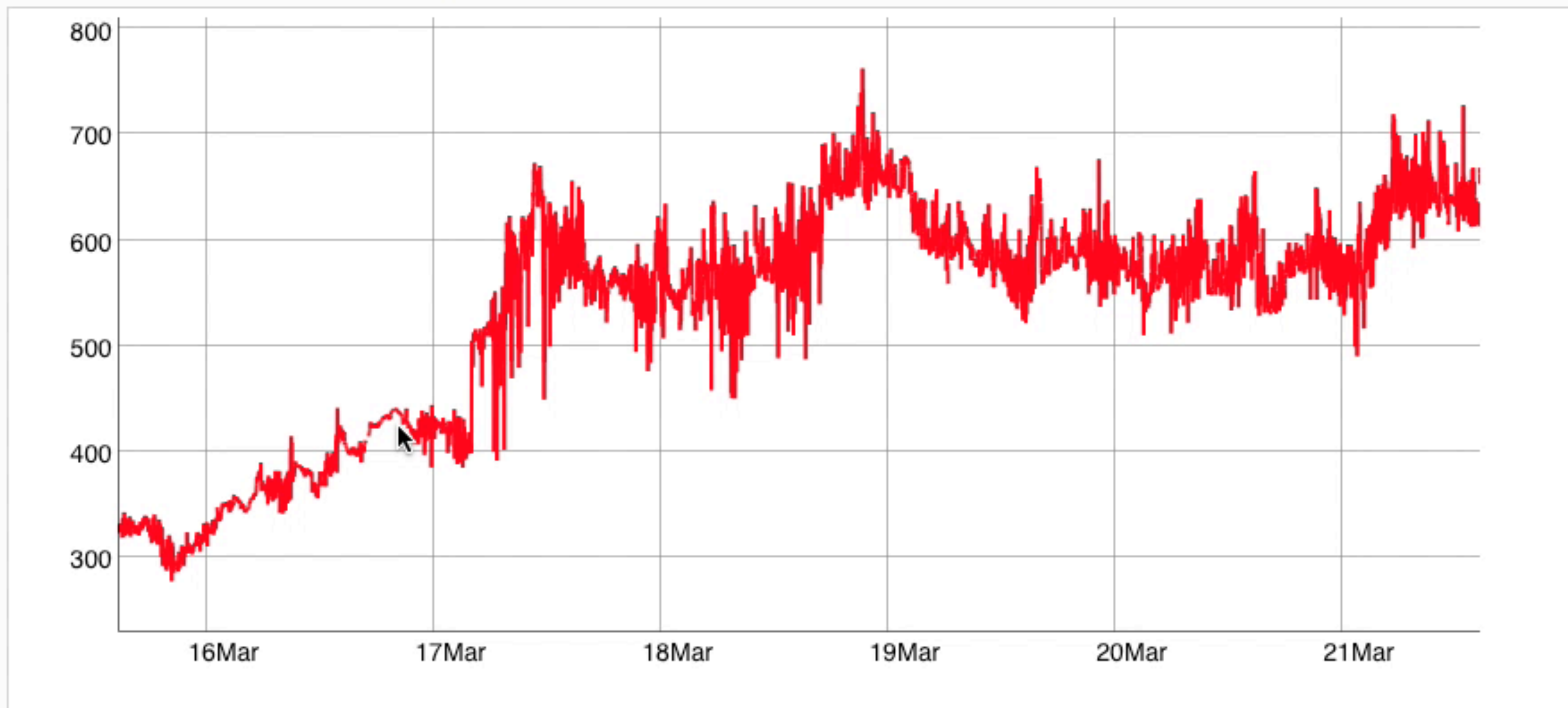
Highly diverse and distributed space weather data consisting of the latest observational data along with the most advanced space weather model simulation output.

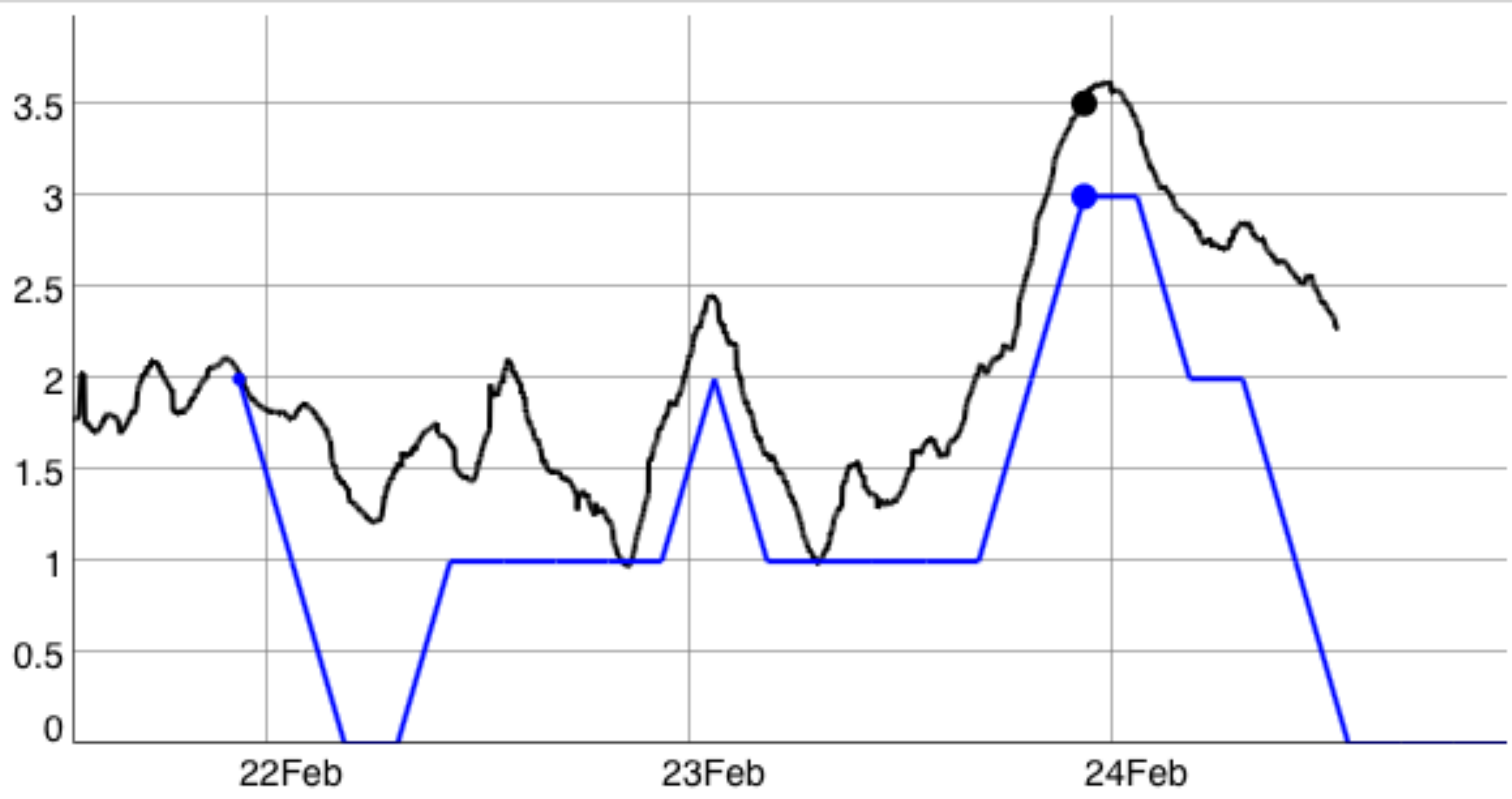
iSWA system collects data from a large and evolving list of sources. Data is sorted, characterized, and processed into 'mission decision supporting' products in response to individual user queries.

iSWA generates and provides a user-configurable display panel that can be accessed from a standard web browser. The end user can then customize their display to focus on specific products of interest.

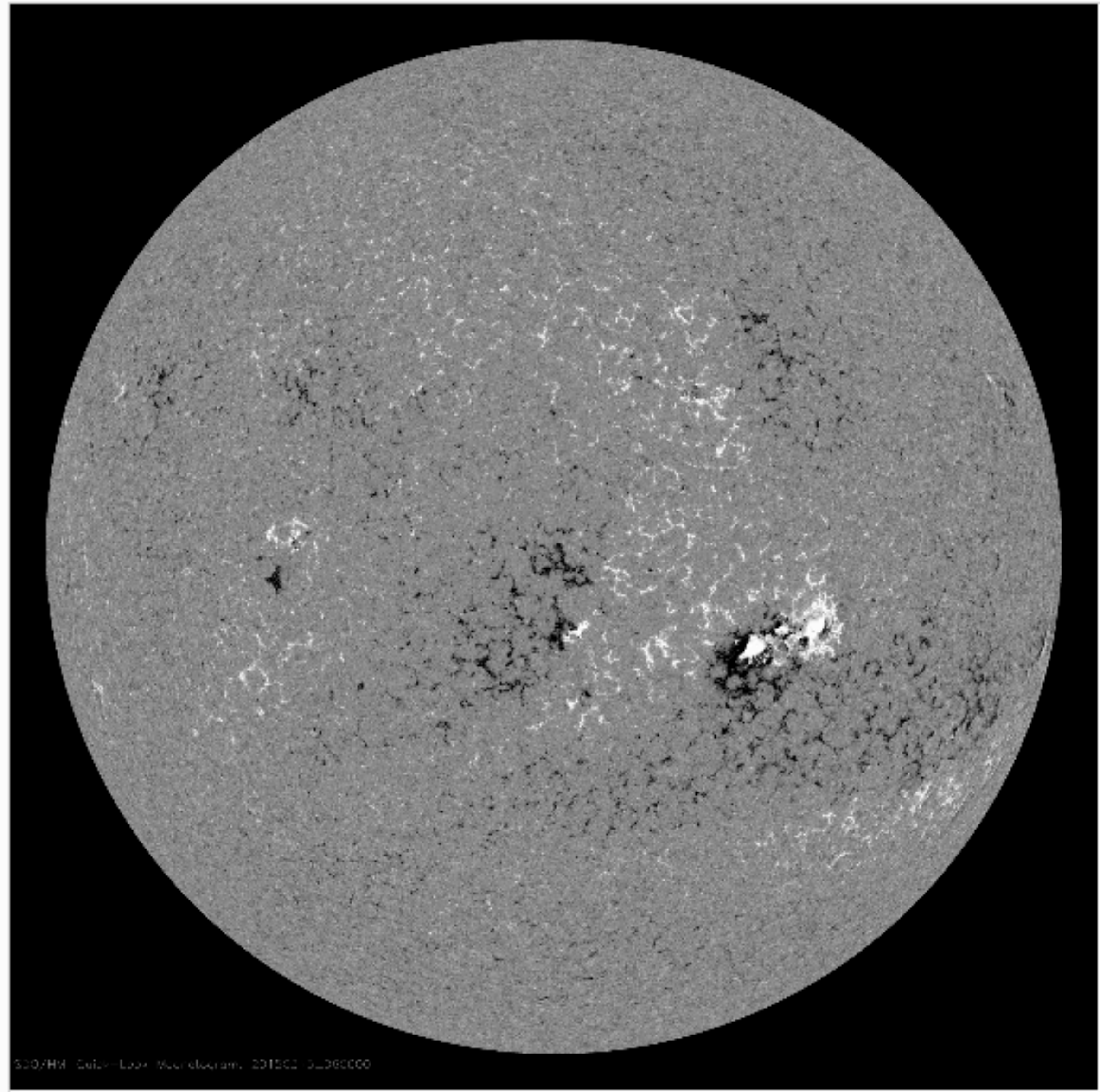
iNTEGRATED SPACE WEATHER ANALYSIS SYSTEM







2016/02/23 22:30:
CCMC-
Predicted_KP.CCMC-
Predicted_KP: KP()
:3.51
NOAA-KP.NOAA-KP:
KP()
:3



SDO/HMI Colorized Magnetogram, 20150315_06090000



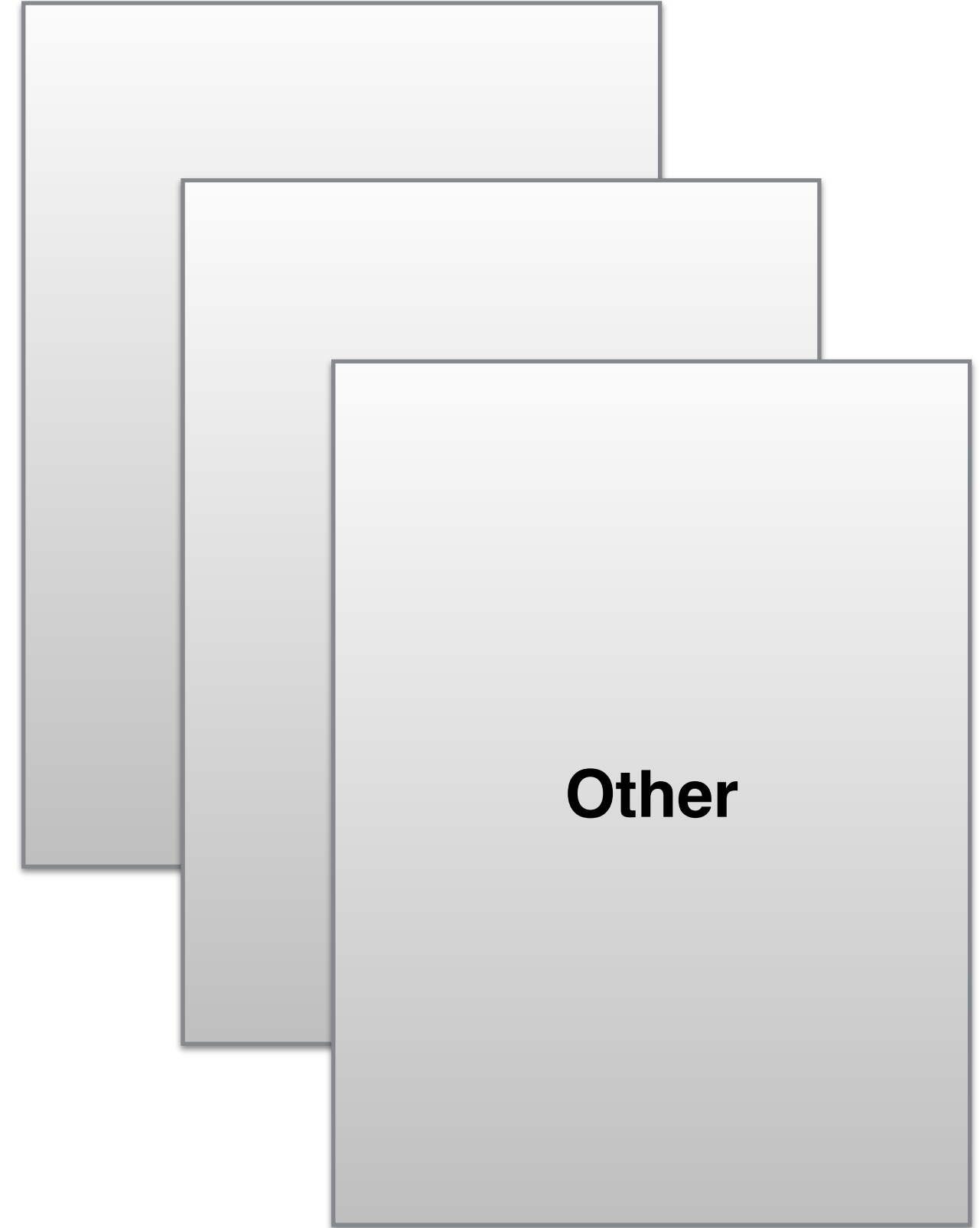
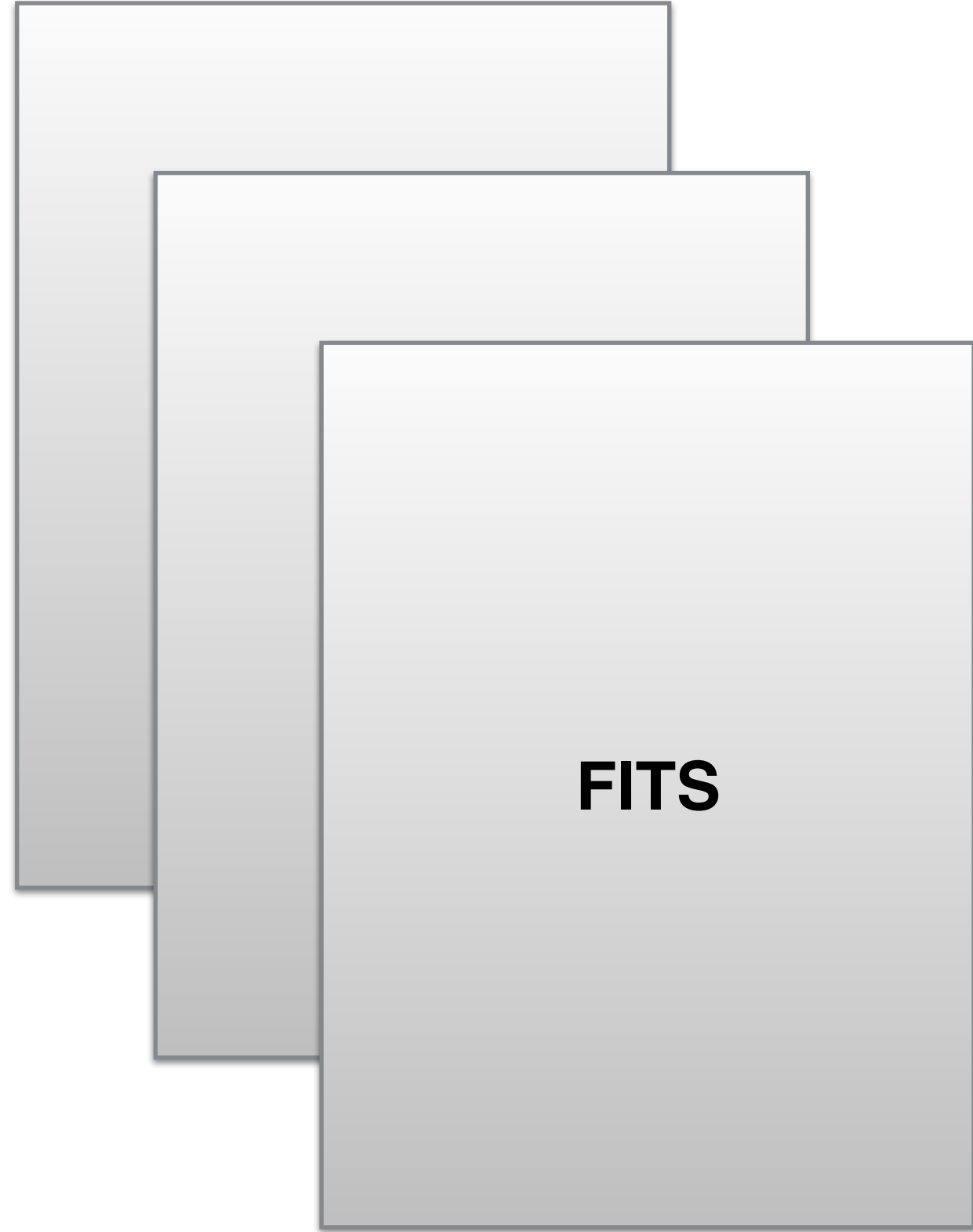
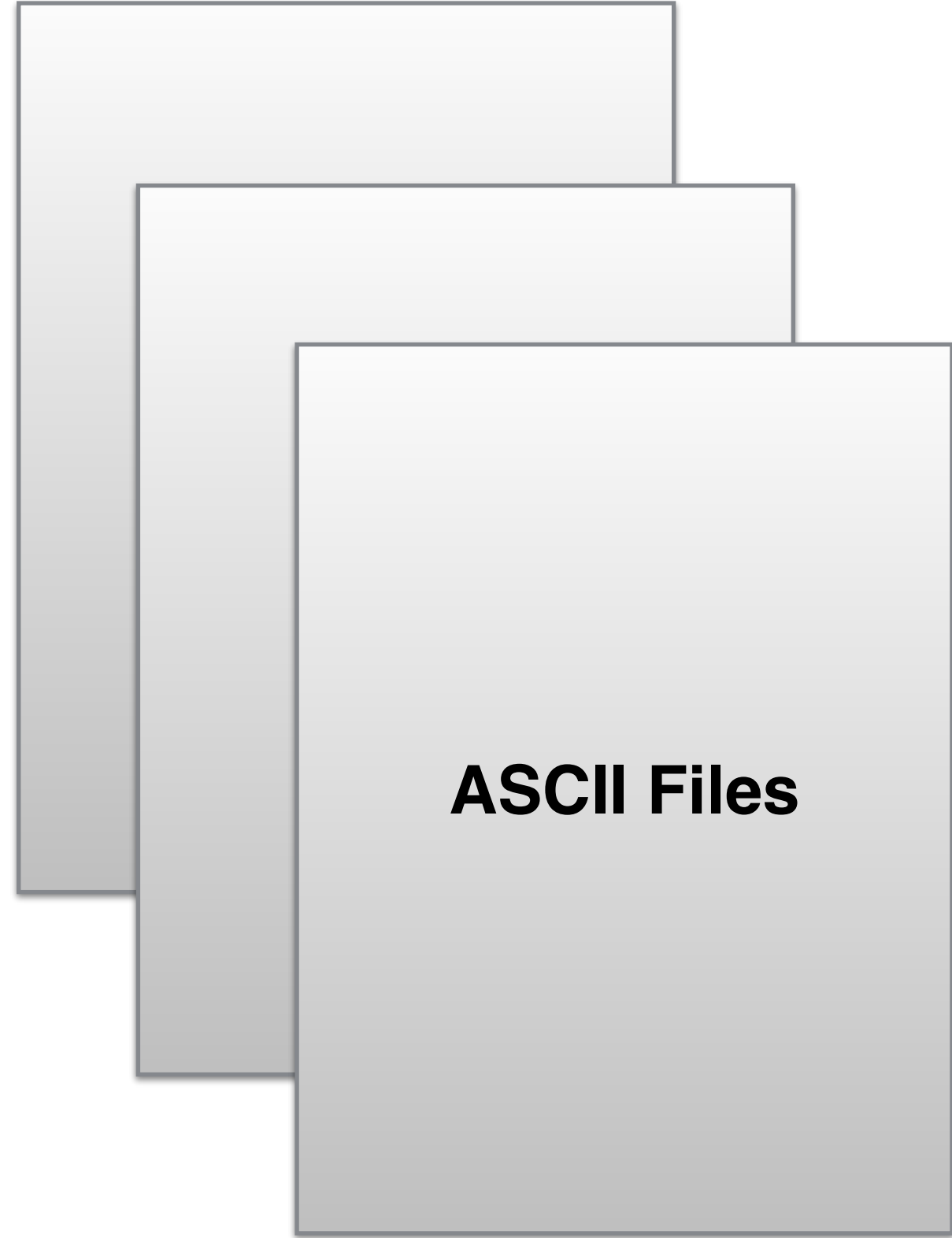
2015-03-15 06:09:01



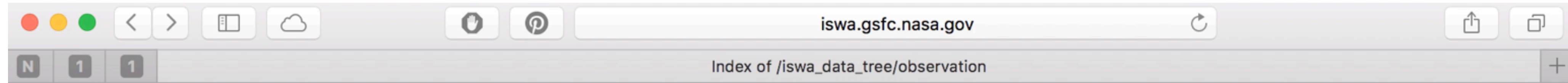
Background

Features











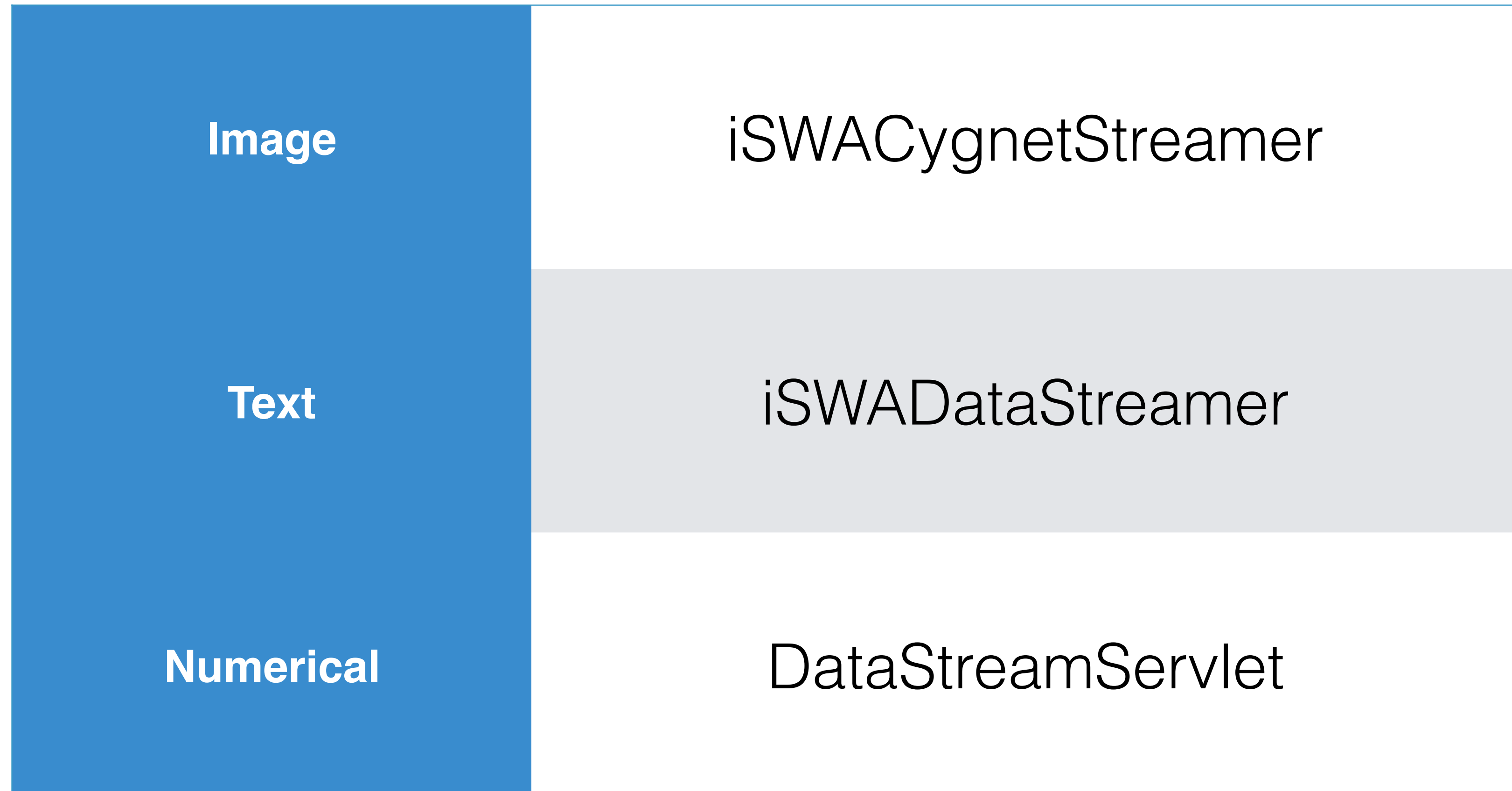
http://iswa.gsfc.nasa.gov/iswa_data_tree/



Index of /iswa_data_tree/observation

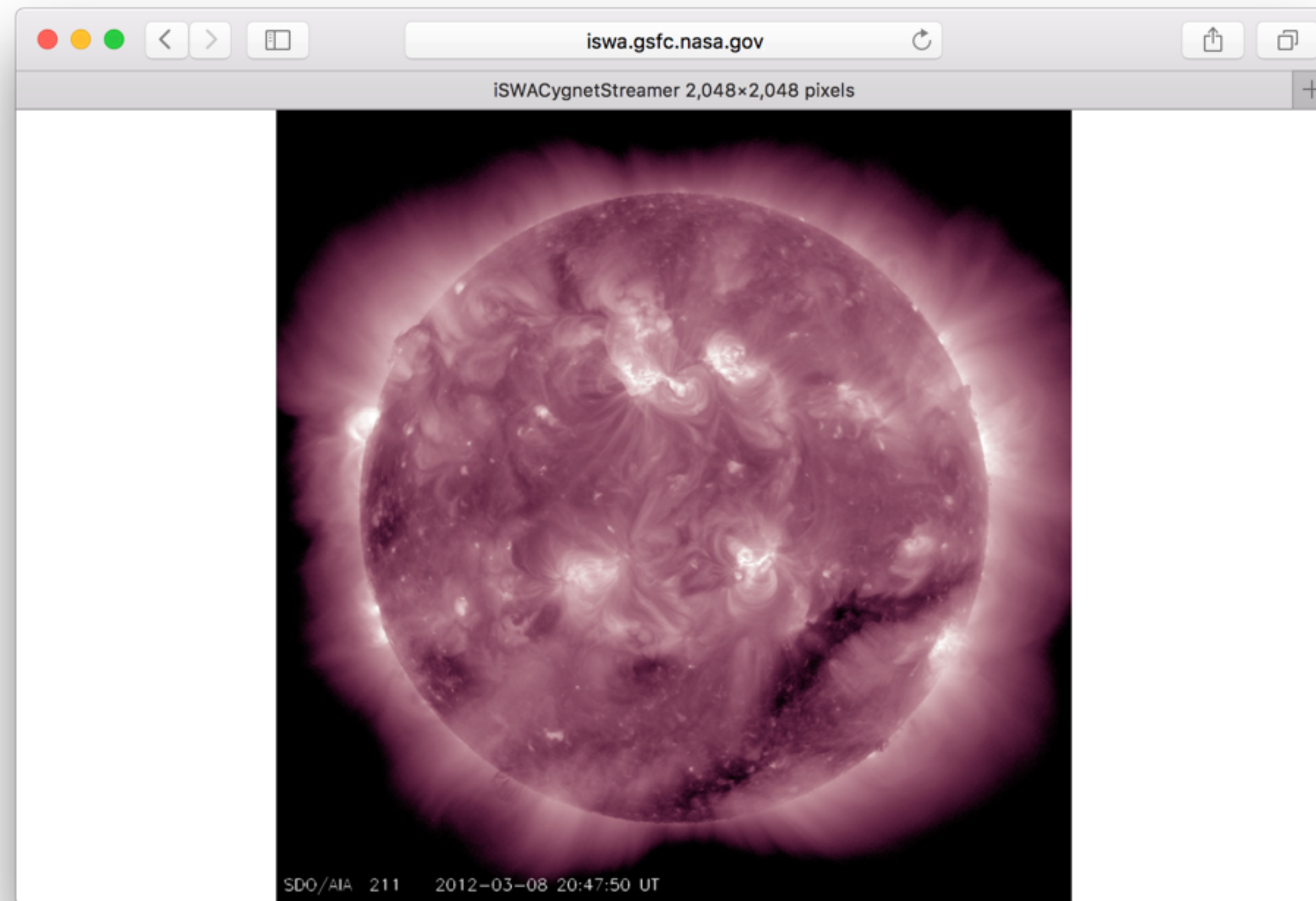
<u>Name</u>	<u>Last modified</u>	<u>Size</u>	<u>Description</u>
 Parent Directory		-	
 heliosphere/	05-Jan-2012 19:40	-	
 ionosphere/	19-Jun-2013 20:26	-	
 magnetosphere/	08-Nov-2013 18:44	-	
 planetary/	12-Feb-2016 16:04	-	
 solar/	09-Dec-2014 20:15	-	

iSWA Streaming



Streaming Image via Cygnet ID

[http://iswa.gsfc.nasa.gov/IswaSystemWebApp/iSWACygnetStreamer?
timestamp=2012-03-09%2000:00:00&window=-1&cygnetId=239](http://iswa.gsfc.nasa.gov/IswaSystemWebApp/iSWACygnetStreamer?timestamp=2012-03-09%2000:00:00&window=-1&cygnetId=239)



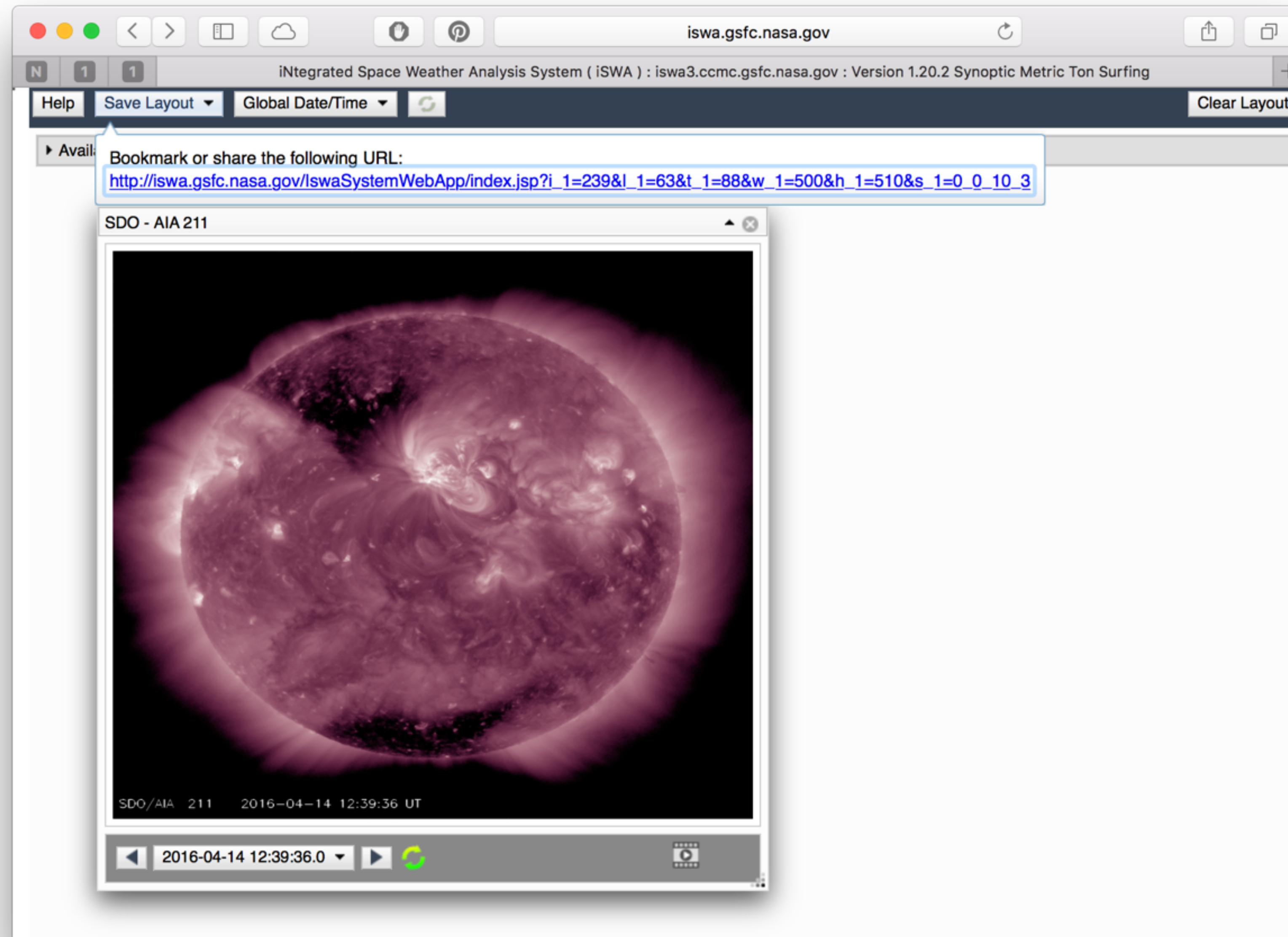
[http://iswa.gsfc.nasa.gov/IswaSystemWebApp/iSWACygnnetStreamer?
timestamp=2012-03-09%2000:00:00&window=-1&cygnnetId=239](http://iswa.gsfc.nasa.gov/IswaSystemWebApp/iSWACygnnetStreamer?timestamp=2012-03-09%2000:00:00&window=-1&cygnnetId=239)

- Timestamp in UTC
- %20 (space in URL) might not be needed
- Timestamp based on iSWA database

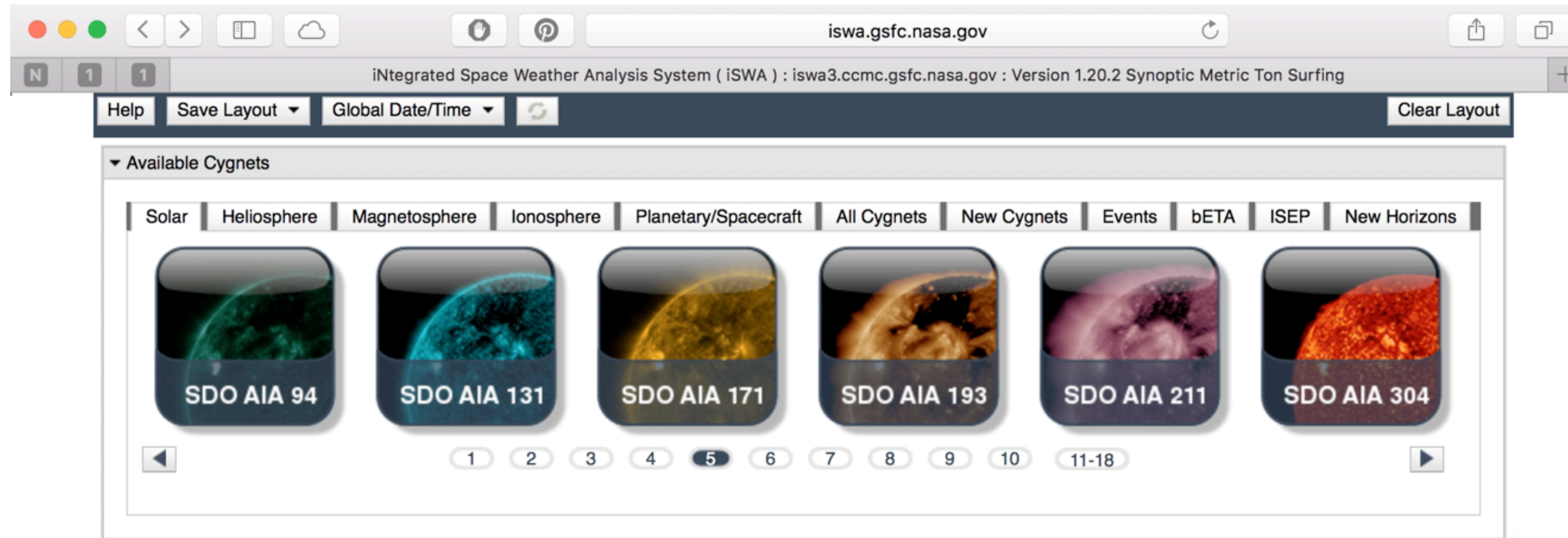
<http://iswa.gsfc.nasa.gov/IswaSystemWebApp/iSWACygnetStreamer?timestamp=2012-03-09%2000:00:00&window=-1&cygnetId=239>

- **window = -1**
 - Most recent data whose timestamp is LESS than specified timestamp
- **window = 0**
 - Only returns data that matches timestamp exactly

<http://iswa.gsfc.nasa.gov/IswaSystemWebApp/iSWACygnetStreamer?timestamp=2012-03-09%2000:00:00&window=-1&cygnetId=239>

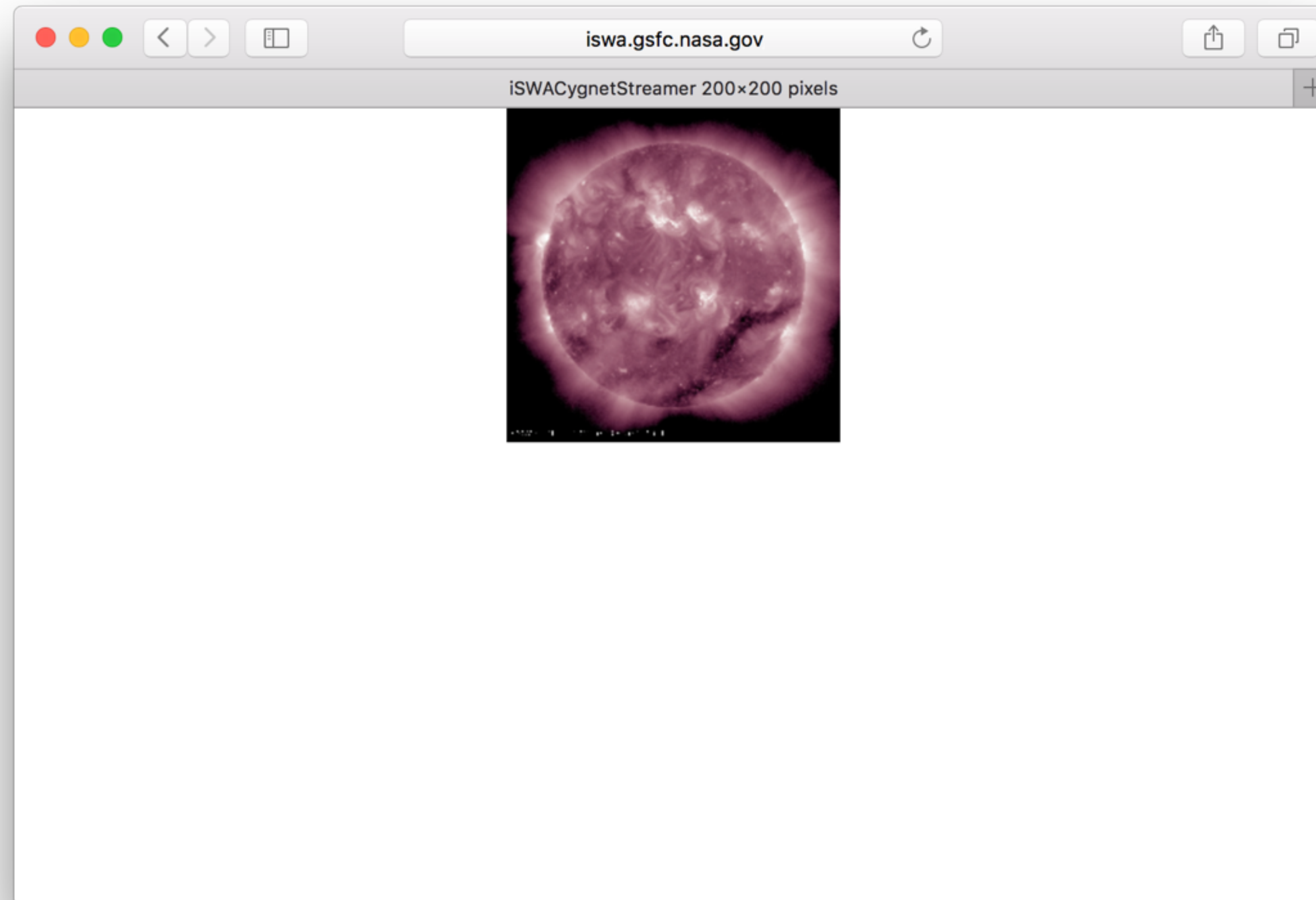


[http://iswa.gsfc.nasa.gov/IswaSystemWebApp/iSWACygnetsStreamer?
timestamp=2012-03-09%2000:00:00&window=-1&cygnetsId=239](http://iswa.gsfc.nasa.gov/IswaSystemWebApp/iSWACygnetsStreamer?timestamp=2012-03-09%2000:00:00&window=-1&cygnetsId=239)



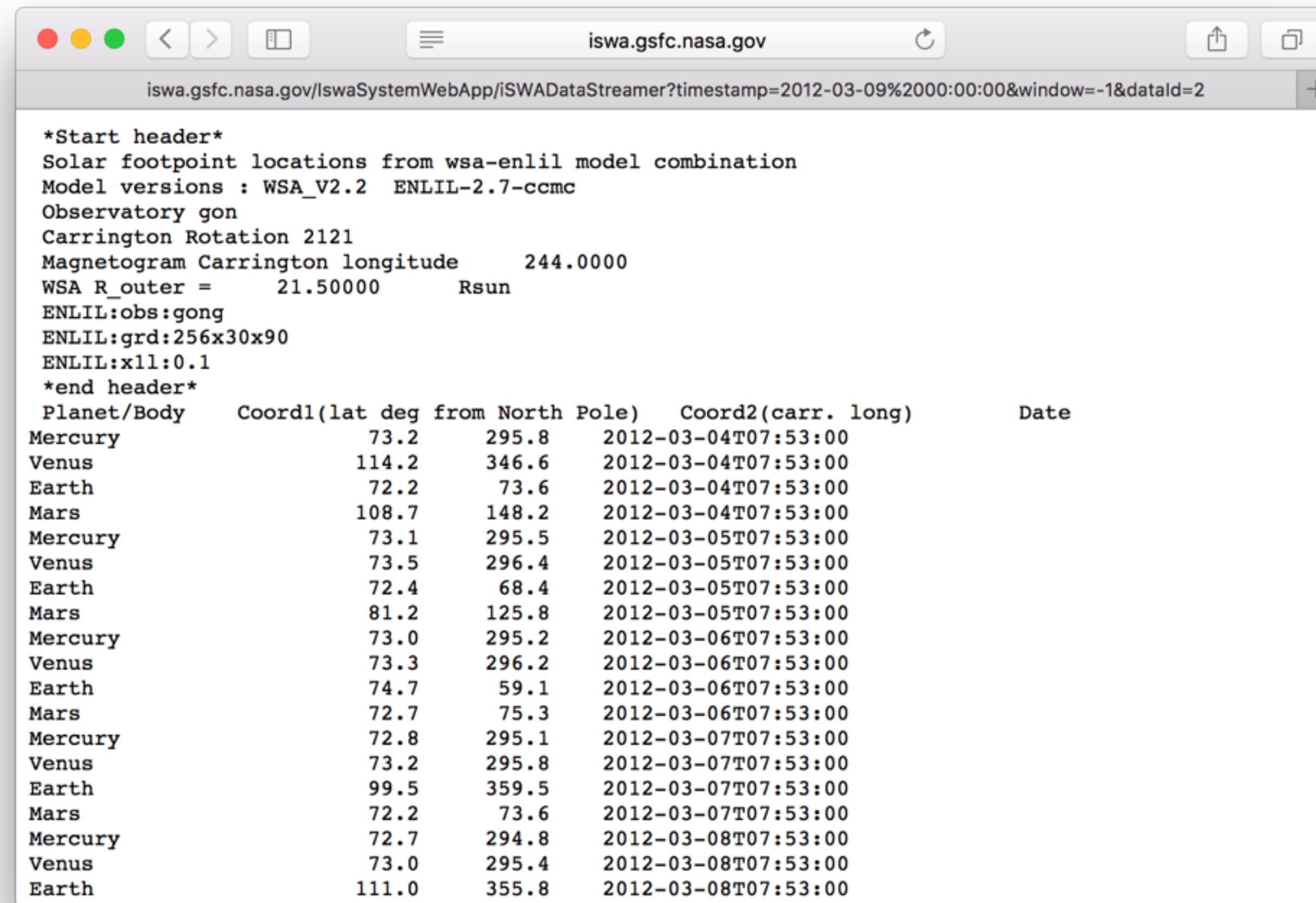
[http://iswa.gsfc.nasa.gov/IswaSystemWebApp/
iSWACygnetStreamer?](http://iswa.gsfc.nasa.gov/IswaSystemWebApp/iSWACygnetStreamer?timestamp=2012-03-09%2000:00:00&window=-1&cygnetId=239)

[timestamp=2012-03-09%2000:00:00&window=-1&cygnetId=239](http://iswa.gsfc.nasa.gov/IswaSystemWebApp/iSWACygnetStreamer?timestamp=2012-03-09%2000:00:00&window=-1&cygnetId=239)
&width=200&height=200



Streaming ASCII via Data ID

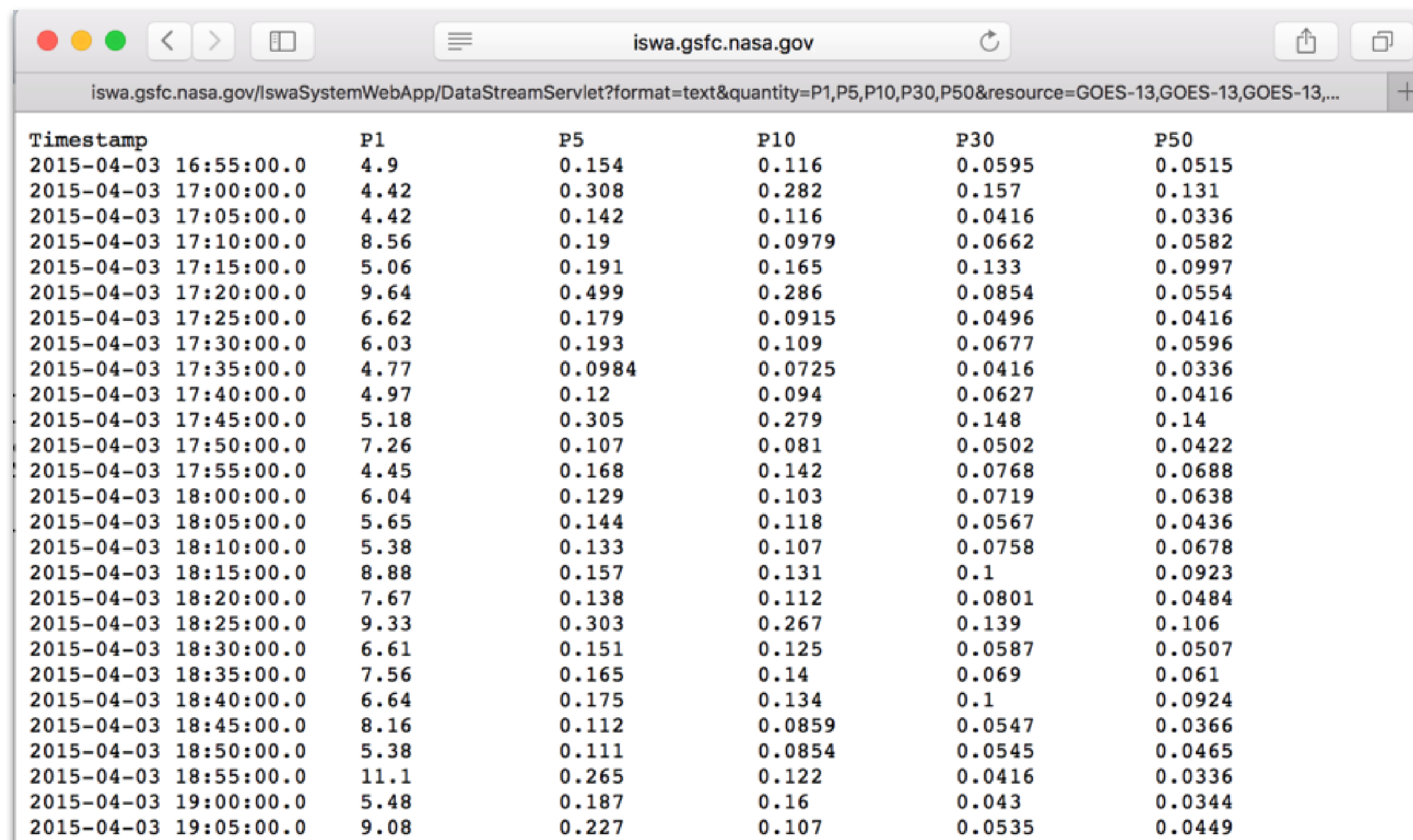
[http://iswa.gsfc.nasa.gov/IswaSystemWebApp/iSWADataStreamer?
timestamp=2012-03-09%2000:00:00&window=-1&dataId=2](http://iswa.gsfc.nasa.gov/IswaSystemWebApp/iSWADataStreamer?timestamp=2012-03-09%2000:00:00&window=-1&dataId=2)



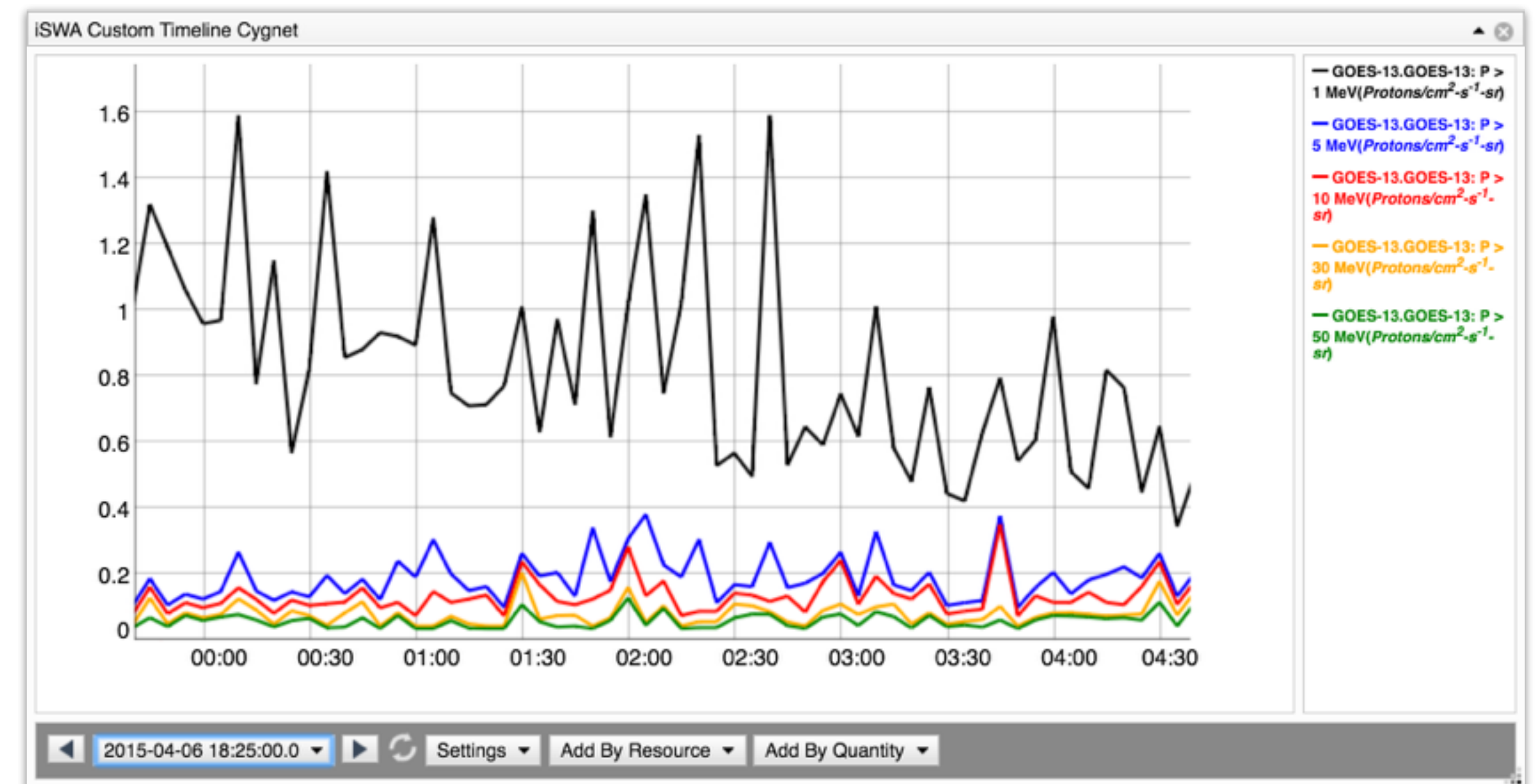
```
*Start header*
Solar footprint locations from wsa-enlil model combination
Model versions : WSA_V2.2 ENLIL-2.7-ccmc
Observatory gon
Carrington Rotation 2121
Magnetogram Carrington longitude      244.0000
WSA R_outer =      21.50000      Rsun
ENLIL:obs:gong
ENLIL:grd:256x30x90
ENLIL:xll:0.1
*end header*
Planet/Body      Coord1(lat deg from North Pole)      Coord2(carr. long)      Date
Mercury          73.2      295.8      2012-03-04T07:53:00
Venus            114.2     346.6      2012-03-04T07:53:00
Earth            72.2       73.6      2012-03-04T07:53:00
Mars             108.7     148.2      2012-03-04T07:53:00
Mercury          73.1      295.5      2012-03-05T07:53:00
Venus            73.5      296.4      2012-03-05T07:53:00
Earth            72.4       68.4      2012-03-05T07:53:00
Mars             81.2     125.8      2012-03-05T07:53:00
Mercury          73.0      295.2      2012-03-06T07:53:00
Venus            73.3      296.2      2012-03-06T07:53:00
Earth            74.7       59.1      2012-03-06T07:53:00
Mars             72.7       75.3      2012-03-06T07:53:00
Mercury          72.8      295.1      2012-03-07T07:53:00
Venus            73.2      295.8      2012-03-07T07:53:00
Earth            99.5     359.5      2012-03-07T07:53:00
Mars             72.2       73.6      2012-03-07T07:53:00
Mercury          72.7      294.8      2012-03-08T07:53:00
Venus            73.0      295.4      2012-03-08T07:53:00
Earth            111.0     355.8      2012-03-08T07:53:00
```


Numerical Data

<http://iswa.gsfc.nasa.gov/IswaSystemWebApp/DataStreamServlet?format=text&quantity=P1,P5,P10,P30,P50&resource=GOES-13,GOES-13,GOES-13,GOES-13,GOES-13&resourceInstance=GOES-13,GOES-13,GOES-13,GOES-13,GOES-13&begin-time=2015-04-03%2000:00:00.0&end-time=2016-04-03%2000:00:00.0>

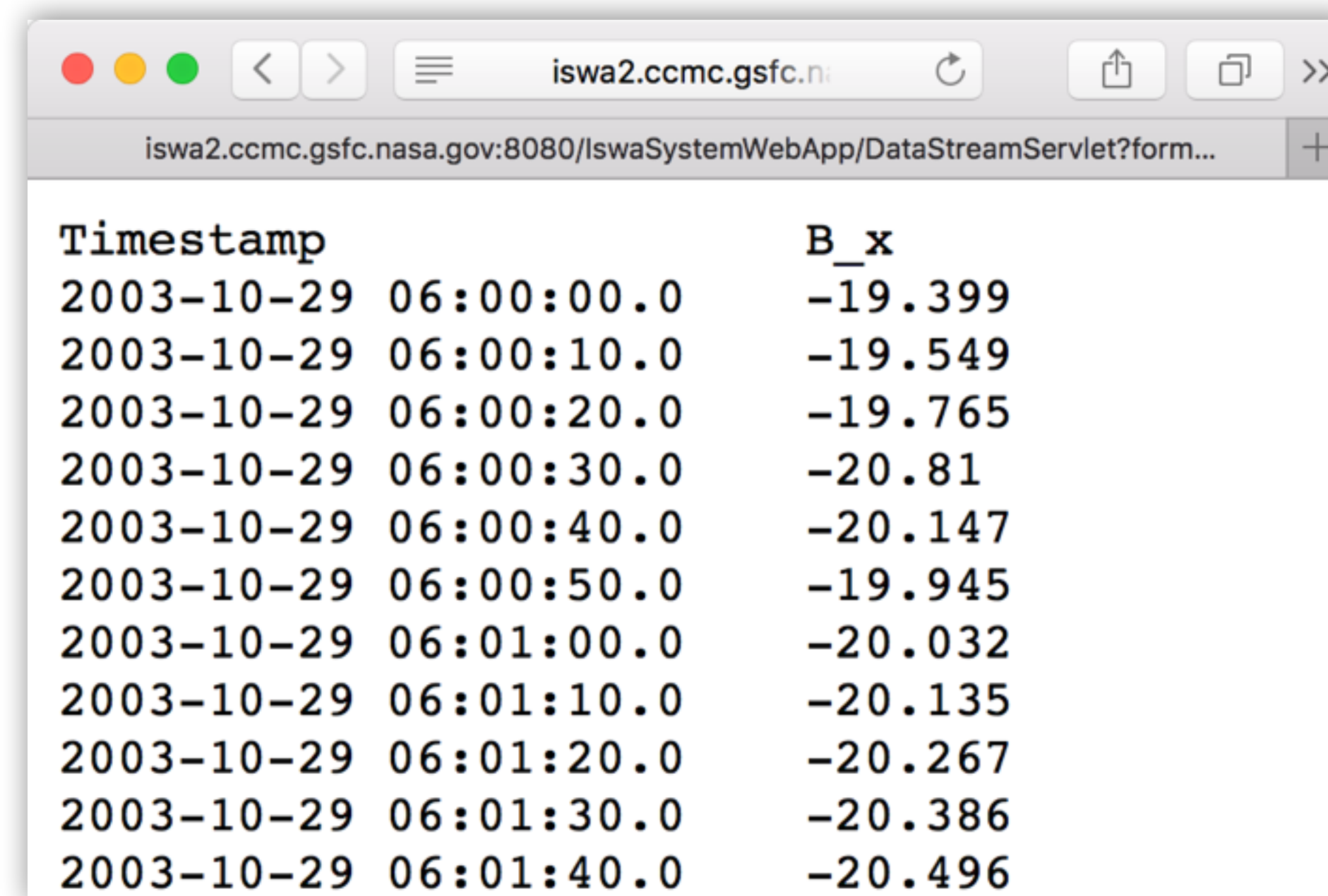


Timestamp	P1	P5	P10	P30	P50
2015-04-03 16:55:00.0	4.9	0.154	0.116	0.0595	0.0515
2015-04-03 17:00:00.0	4.42	0.308	0.282	0.157	0.131
2015-04-03 17:05:00.0	4.42	0.142	0.116	0.0416	0.0336
2015-04-03 17:10:00.0	8.56	0.19	0.0979	0.0662	0.0582
2015-04-03 17:15:00.0	5.06	0.191	0.165	0.133	0.0997
2015-04-03 17:20:00.0	9.64	0.499	0.286	0.0854	0.0554
2015-04-03 17:25:00.0	6.62	0.179	0.0915	0.0496	0.0416
2015-04-03 17:30:00.0	6.03	0.193	0.109	0.0677	0.0596
2015-04-03 17:35:00.0	4.77	0.0984	0.0725	0.0416	0.0336
2015-04-03 17:40:00.0	4.97	0.12	0.094	0.0627	0.0416
2015-04-03 17:45:00.0	5.18	0.305	0.279	0.148	0.14
2015-04-03 17:50:00.0	7.26	0.107	0.081	0.0502	0.0422
2015-04-03 17:55:00.0	4.45	0.168	0.142	0.0768	0.0688
2015-04-03 18:00:00.0	6.04	0.129	0.103	0.0719	0.0638
2015-04-03 18:05:00.0	5.65	0.144	0.118	0.0567	0.0436
2015-04-03 18:10:00.0	5.38	0.133	0.107	0.0758	0.0678
2015-04-03 18:15:00.0	8.88	0.157	0.131	0.1	0.0923
2015-04-03 18:20:00.0	7.67	0.138	0.112	0.0801	0.0484
2015-04-03 18:25:00.0	9.33	0.303	0.267	0.139	0.106
2015-04-03 18:30:00.0	6.61	0.151	0.125	0.0587	0.0507
2015-04-03 18:35:00.0	7.56	0.165	0.14	0.069	0.061
2015-04-03 18:40:00.0	6.64	0.175	0.134	0.1	0.0924
2015-04-03 18:45:00.0	8.16	0.112	0.0859	0.0547	0.0366
2015-04-03 18:50:00.0	5.38	0.111	0.0854	0.0545	0.0465
2015-04-03 18:55:00.0	11.1	0.265	0.122	0.0416	0.0336
2015-04-03 19:00:00.0	5.48	0.187	0.16	0.043	0.0344
2015-04-03 19:05:00.0	9.08	0.227	0.107	0.0535	0.0449



Numerical 1-D Model Data

http://iswa2.ccmc.gsfc.nasa.gov:8080/IswaSystemWebApp/DataStreamServlet?format=text&resource=SWMF&resourceInstance=SWMF773atGOES10&quantity=B_x&ccmcID=ccmc_ccmc_082208_1a&modelID=1_SWMF&begin-time=2003-10-29%2000:00:00&end-time=2003-10-30%2006:00:00

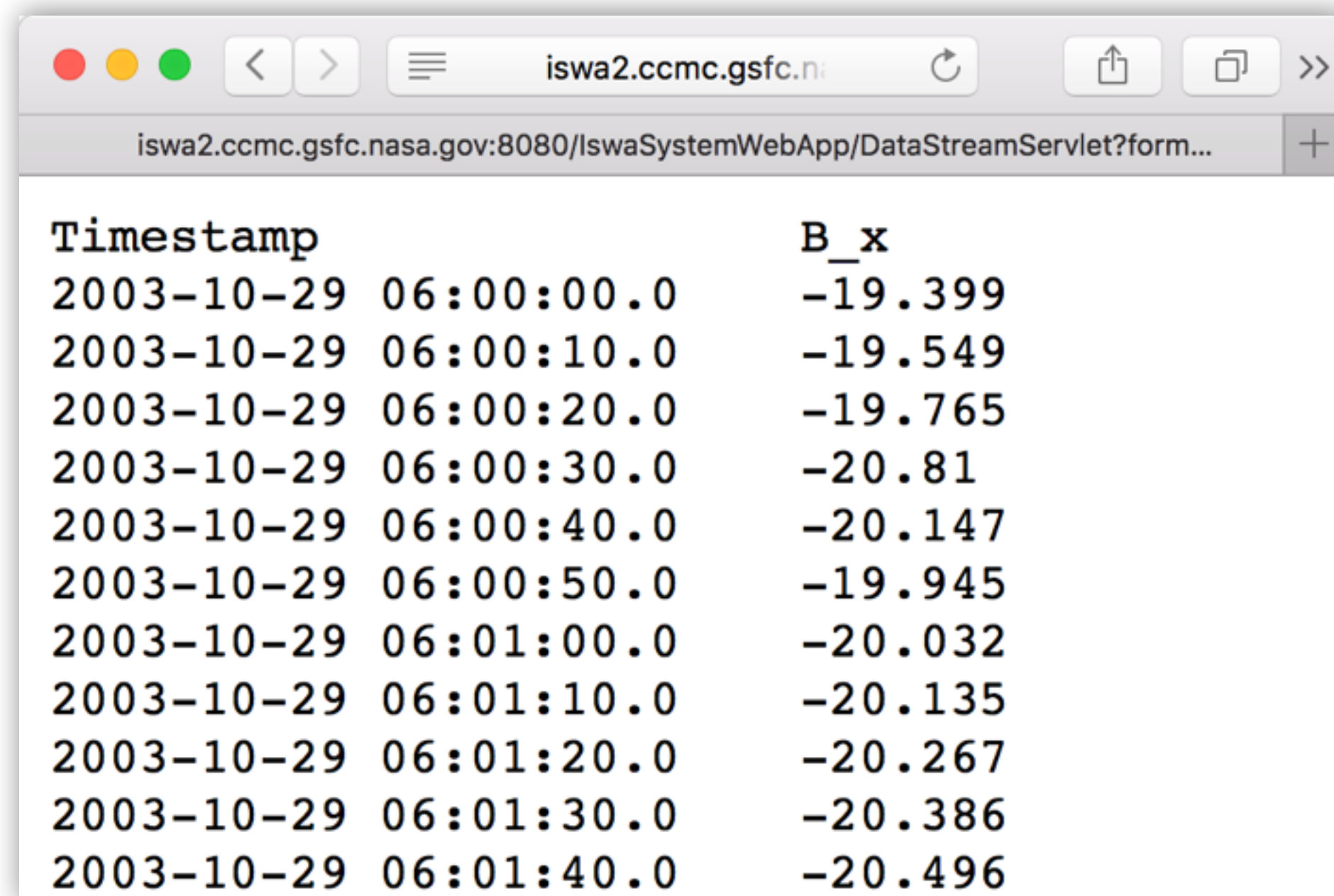


The image shows a screenshot of a web browser window displaying a table of numerical data. The browser's address bar shows the URL: `iswa2.ccmc.gsfc.n...`. The table has two columns: `Timestamp` and `B_x`. The data consists of 12 rows, each representing a time step on 2003-10-29. The `B_x` values range from approximately -19.399 to -20.496.

Timestamp	B_x
2003-10-29 06:00:00.0	-19.399
2003-10-29 06:00:10.0	-19.549
2003-10-29 06:00:20.0	-19.765
2003-10-29 06:00:30.0	-20.81
2003-10-29 06:00:40.0	-20.147
2003-10-29 06:00:50.0	-19.945
2003-10-29 06:01:00.0	-20.032
2003-10-29 06:01:10.0	-20.135
2003-10-29 06:01:20.0	-20.267
2003-10-29 06:01:30.0	-20.386
2003-10-29 06:01:40.0	-20.496

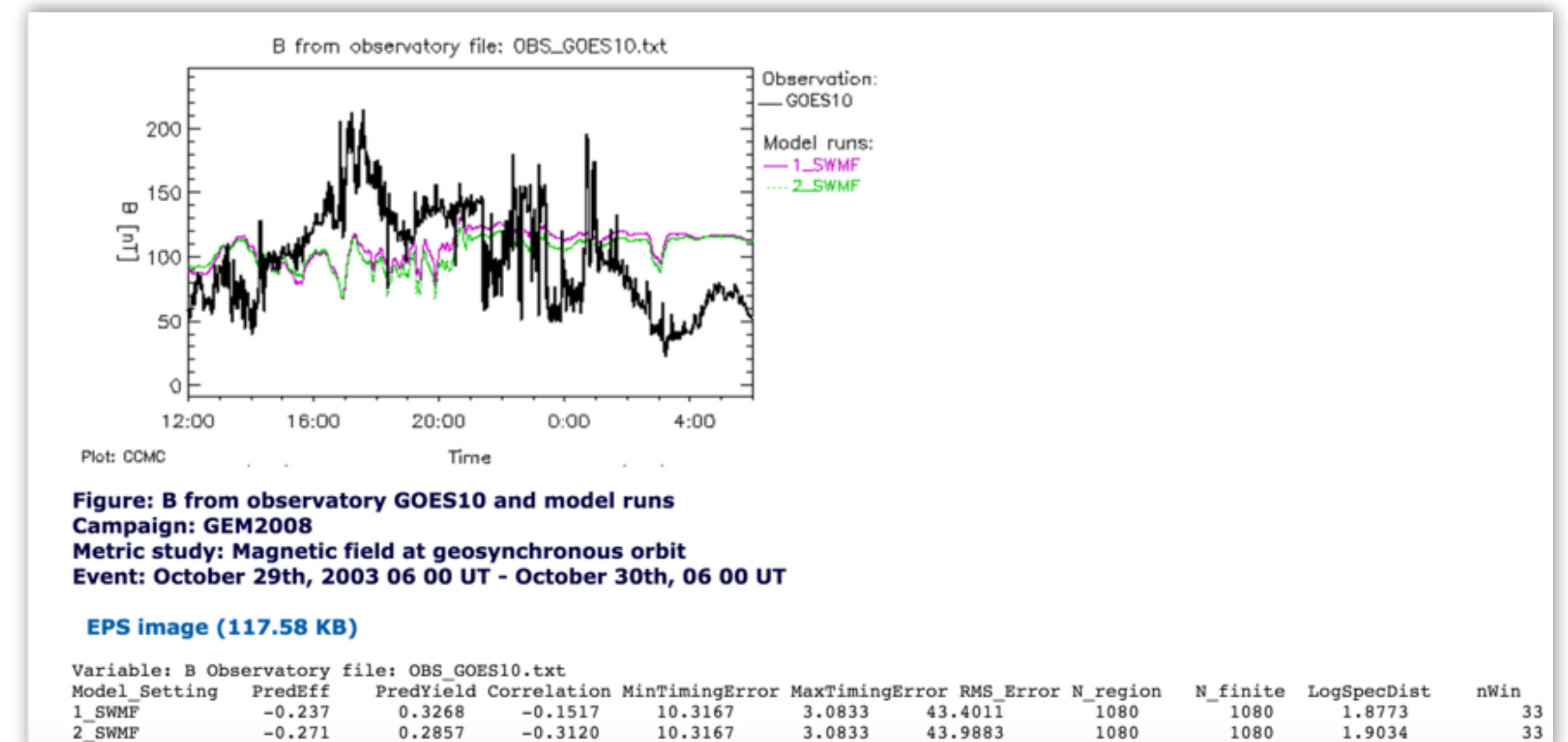
Numerical 1-D Model Data

http://iswa2.ccmc.gsfc.nasa.gov:8080/IswaSystemWebApp/DataStreamServlet?format=text&resource=SWMF&resourceInstance=SWMF773atGOES10&quantity=B_x&ccmcID=ccmc_ccmc_082208_1a&modelID=1_SWMF&begin-time=2003-10-29%2000:00:00&end-time=2003-10-30%2006:00:00



The screenshot shows a web browser window with the URL `iswa2.ccmc.gsfc.nasa.gov:8080/IswaSystemWebApp/DataStreamServlet?format=text&resource=SWMF&resourceInstance=SWMF773atGOES10&quantity=B_x&ccmcID=ccmc_ccmc_082208_1a&modelID=1_SWMF&begin-time=2003-10-29%2000:00:00&end-time=2003-10-30%2006:00:00`. The browser displays a table with two columns: 'Timestamp' and 'B_x'. The data points are as follows:

Timestamp	B_x
2003-10-29 06:00:00.0	-19.399
2003-10-29 06:00:10.0	-19.549
2003-10-29 06:00:20.0	-19.765
2003-10-29 06:00:30.0	-20.81
2003-10-29 06:00:40.0	-20.147
2003-10-29 06:00:50.0	-19.945
2003-10-29 06:01:00.0	-20.032
2003-10-29 06:01:10.0	-20.135
2003-10-29 06:01:20.0	-20.267
2003-10-29 06:01:30.0	-20.386
2003-10-29 06:01:40.0	-20.496



Numerical 1-D Model Data

improved validation application

- No more file tree management
- Interactive graphs rather than static images
- User defined events (cross-event skill scores) and metrics

Future

- Impex metadata standard and apis
- Metadata header in numerical data servlet
- More datasets and customized web services

Documentation

<http://ccmc.gsfc.nasa.gov/challenges/flareinfo/api.pdf>