



PLASTIC

PLasma And Supra-Thermal
Ion Composition investigation



STEREO SWG: PLASTIC STATUS

Toni Galvin (UNH)
for the PLASTIC Team

Special thanks to Lorna Ellis (Data), Mark Popecki (Ops)

STEREO PLASTIC Institutions:
UNH, U Bern, MPE, U Kiel, NASA/GSFC
IDPU/LVC provided by UCB (IMPACT)

Outline

- **PLASTIC status since last SWG**
 - Papers and Conferences
 - Online Data Status
 - Beacon Status
 - Operational Status
 - EPO

Papers Published/Submitted/In Preparation (since Mar07 SWG)

- STEREO Instrument Papers - Space Science Reviews (in press)
- Gosling et al., ***Five Spacecraft Observations of Oppositely Directed Exhaust Jets from a Magnetic Reconnection X-line Extending $> 4.26 \times 10^6$ km in the Solar Wind At 1 AU***, Geophys. Res. Lett., 34, L20108, doi:10.1029/2007GL031492, 2007
- Leitner, et al., ***Consequences of the force--free model of magnetic clouds for their heliospheric evolution***, J. Geophys. Res., Vol. 112, doi:10.1029/2006JA011940, 2007.
- Farrugia et al., ***Tenuous solar winds: Insights on solar wind-magnetosphere interactions***, in press, J. Atmospheric, Solar and Terrestrial Physics, doi:10.1016/j.jastp.2007.08.032, 2007.
- Möstl et al., ***Two-spacecraft reconstruction of a magnetic cloud and comparison to its solar source***, Ann. Geophys., submitted August 2007.
- Podesta, JJ., A.B. Galvin, C.F. Farrugia, ***Correlation length of solar wind fluctuations measured tangent to the earth's orbit: First results from STEREO***, submitted to JGR, Oct 2007.
- Daoudi et al., ***The STEREO/PLASTIC response to slow solar wind ions (flight measurements and models)***, to be submitted to Astrophys. Space Sci. Trans.
- Eriksson et al., ***Shear-flow effects on magnetic field configuration within a solar wind reconnection exhaust***, to be submitted to GRL
- L.M. Kistler and L. Ellis, ***PLASTIC Level 1 Data Document***, Version F (Nov 2007), <http://sohowww.nascom.nasa.gov/solarsoft/ster eo/plastic/documents/Level1Data.doc>

Conference Presentations

(since last SWG: AGU, IUGG, SPD, SHINE, SOHO20, LWS)

- Galvin et al., *First Results from the STEREO Plasma and Suprathermal Ion Composition Investigation*, IUGG, Perugia, Italy, July 2007.
- Galvin, et al., *Early Solar Wind Observations from the Plasma and Suprathermal Ion Composition (PLASTIC) Experiments on STEREO*, *Eos Trans. AGU*, 88(23), Jt. Assem. Suppl., Abstract SH34A-01, 2007.
- Galvin, et al., *The Plasma and Suprathermal Ion Composition Experiment on STEREO -- Early Results*, SOHO20, Belgium, August 2007.
- Galvin et al., *Solar Wind and Suprathermal Ion Observations from STEREO PLASTIC*, Living with a Star Science Workshop "From the Sun towards the Earth, Boulder, CO, September 2007.
- Gosling, et al., *STEREO, ACE and Wind Observations of Reconnection X-line Extents and Durations in the Solar Wind*, *Eos Trans. AGU*, 88(23), Jt. Assem. Suppl., Abstract SH34A-07, 2007.
- Karrer et al., *Helium distribution and heavy ion composition, First results from PLASTIC instrument onboard STEREO*, IUGG, Perugia, Italy, July 2007.
- Kistler, et al., *Observations of Energetic O⁺ in the Distant Tail Magnetosheath: Results from STEREO/PLASTIC*, *Eos Trans. AGU*, 88(23), Jt. Assem. Suppl., Abstract SH34A-03, 2007.
- Kistler, et al., *Observations of Energetic O⁺ in the Distant Tail: Results from STEREO B*, IUGG, Perugia, Italy, July 2007.
- Klecker et al., *On the variability of suprathermal He⁺: new results from STEREO and SOHO*, *Eos Trans. AGU*, 88(23), Jt. Assem. Suppl., Abstract SH34A-02, 2007.
- Kucharek, et al, *Observations of He⁺ and He⁺² from STEREO PLASTIC*, SHINE 2007 Workshop, Whistler, Canada, August 2007.
- Luhmann, et al., *STEREO's in-situ perspective on the solar minimum solar wind structure*, *Eos Trans. AGU*, 88(23), Jt. Assem. Suppl., Abstract SH34A-04, 2007.
- Möstl, et al., *Do Magnetic Clouds Deform?*, IUGG, Perugia, Italy, July 2007.
- Möstl, et al., *Two-spacecraft reconstruction of a magnetic cloud and comparison to its solar source*, SOHO20, Belgium, Aug 2007.
- Opitz, et al., *Solar wind bulk properties as seen by STEREO/PLASTIC*, IUGG, Perugia, Italy, July 2007.
- Popecki, et al., *Initial Results from STEREO/PLASTIC*, Solar Physics Division, Am. Astro. Soc., Session/Paper 028.06, 2007.
- Popecki, et al., *Heavy Ion Observations in the Solar Wind from STEREO/PLASTIC*, SHINE 2007 Workshop, Whistler, Canada, August 2007.
- Simunac, et al., *Bulk Properties of Solar Wind Protons: Inter-comparison of Observations From STEREO, SOHO, ACE, and WIND*, *Eos Trans. AGU*, 88(23), Jt. Assem. Suppl., Abstract SH41A-10, 2007.

Dissertations and Thesis (since Mar07 SWG)

Reto Karrer, *Ion optical calibration of the PLASTIC sensor on STEREO*, Ph.D. thesis, University of Bern, Switzerland, 2007.

Andrea Opitz, *STEREO PLASTIC calibration, simulation and data analysis*, Ph.D. thesis, University of Bern, Switzerland, 2007.

Catherine Walker, *Variations of Solar Wind Parameters over a Solar Cycle: Expectations for NASA's Solar Terrestrial Relations Observatory (STEREO) Mission*, Astronomy Honors, B.S., Mount Holyoke College, MA, 2007.

Jason Carroll, **Practical Consequences of Penetrating Radiation for Space Flight Instrumentation**, Physics Honors, B.S., University of New Hampshire, NH, 2007.

In Progress:

Kristin Simunac, *Multi-spacecraft Observations of the Geometry of Stream Interfaces (STEREO)*, Ph.D. dissertation, UNH, Durham, NH.

Data and S/W Status

- Public Domain at <http://stereo.sr.unh.edu> and/or SolarSoft
- Public Domain, validated data and software includes
 - Proton bulk parameters (validated 10-min bulk parameters with data quality flags), Feb(A)/Mar(B) through Sept 2007
 - Browse weekly stack plots, Feb(A)/Mar(B) through Sept 2007
 - Level 1 CDFs and documentation, up to present
 - STEREO PLASTIC L1 Analysis Software (*SPLAT*) and documentation Interactive plotting software for L1 CDF files. (*SPLAT* uses *TPLLOT* heritage.)
 - *Read_CDF* (s/w and documentation for making ascii versions of data)
 - *Science_Overview* (s/w for making science summary plots)

Data and S/W Status

- Public Domain in Progress (currently under final testing)
 - OnBoard Moments Daily, Validated (1-min bulk velocity, density, temperature, with a data quality flags)
 - OnBoard Moments Monthly, Validated (30-min bulk velocity, density, temperature, with a data quality flags)
 - Level 2 Moments CDFs
 - Full resolution Daily Housekeeping
- Internal Domain (used for validation purposes)
 - OB Moment comparison
 - Moment Efficiencies
 - Monitor Rates

Online PLASTIC

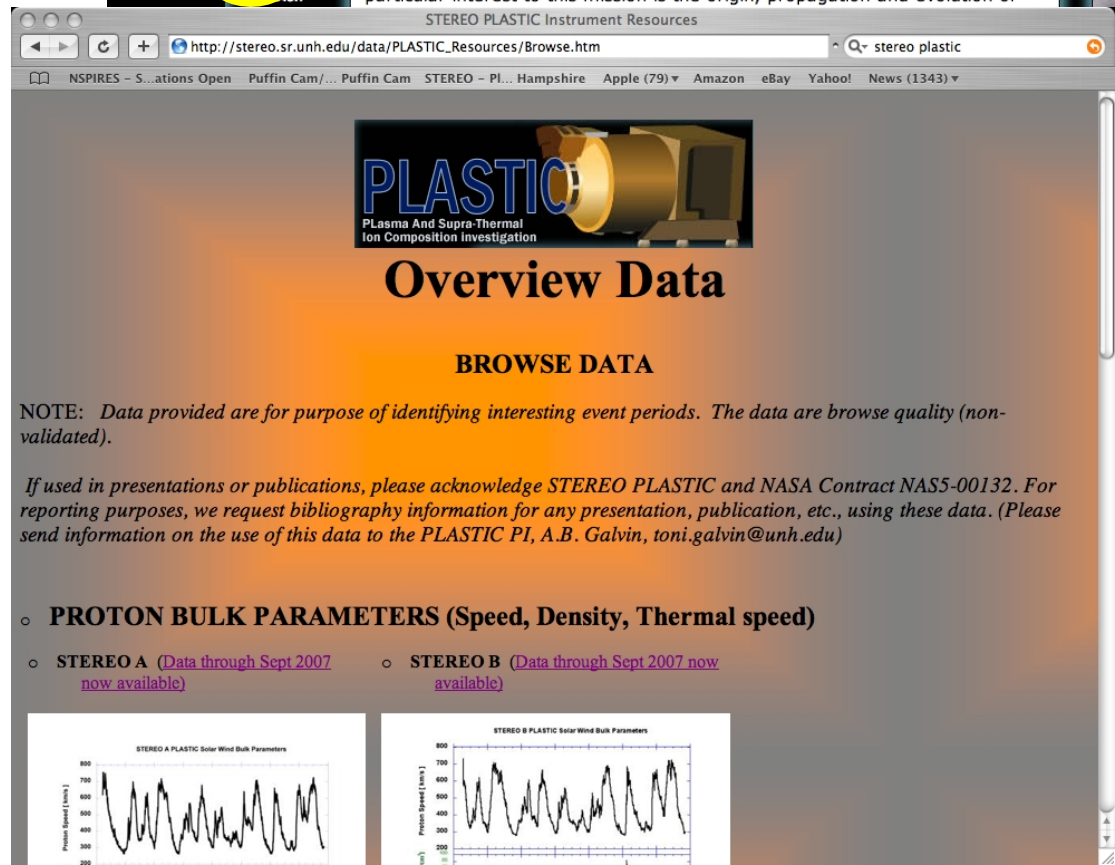
- PLASTIC
Homepage

<http://stereo.sr.unh.edu>

- Data Files

[http://stereo.sr.unh.edu/
data/PLASTIC_Resources
/Browse.htm](http://stereo.sr.unh.edu/data/PLASTIC_Resources/Browse.htm)

- Data through
Sept 30, 2007



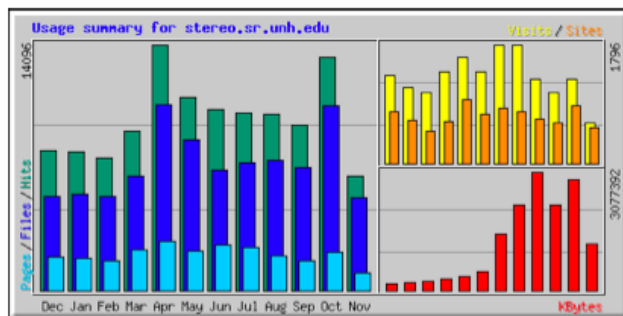
Web Statistics Are Now In Place

Usage Statistics for stereo.sr.unh.edu - Last 12 Months

11/13/2007 01:19 AM

Usage Statistics for stereo.sr.unh.edu

Summary Period: Last 12 Months
Generated 13-Nov-2007 00:15 EST



Summary by Month										
Month	Daily Avg				Monthly Totals					
	Hits	Files	Pages	Visits	Sites	KBytes	Visits	Pages	Files	Hits
Nov 2007	506	407	77	47	548	1203743	612	1004	5297	6579
Oct 2007	431	342	69	41	878	2864941	1272	2169	10614	13391
Sep 2007	315	235	57	35	610	2201180	1077	1713	7064	9451
Aug 2007	324	241	62	40	672	3077392	1266	1948	7480	10069
Jul 2007	327	237	80	57	779	2210392	1790	2488	7353	10153
Jun 2007	346	231	87	59	828	1461894	1796	2626	6933	10402
May 2007	358	278	73	44	751	476737	1391	2269	8646	11099
Apr 2007	469	354	94	53	963	374035	1596	2826	10627	14096
Mar 2007	294	211	74	44	640	301468	1382	2312	6568	9144
Feb 2007	270	191	61	38	481	228313	1073	1732	5361	7577
Jan 2007	256	178	59	36	642	208087	1146	1833	5526	7941
Dec 2006	259	173	61	42	775	166099	1321	1898	5384	8041
Totals						14774281	15722	24818	86853	117943

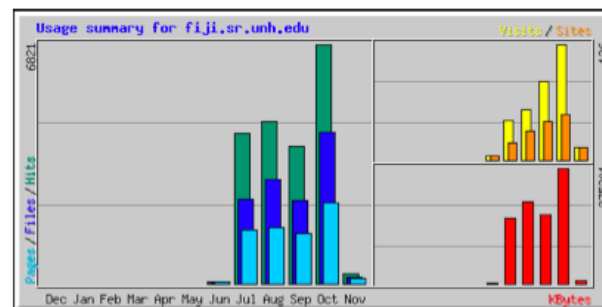
Generated by [Webalizer Version 2.01](#)

Usage Statistics for fiji.sr.unh.edu - Last 12 Months

11/13/2007 01:19 AM

Usage Statistics for fiji.sr.unh.edu

Summary Period: Last 12 Months
Generated 12-Nov-2007 04:02 EST

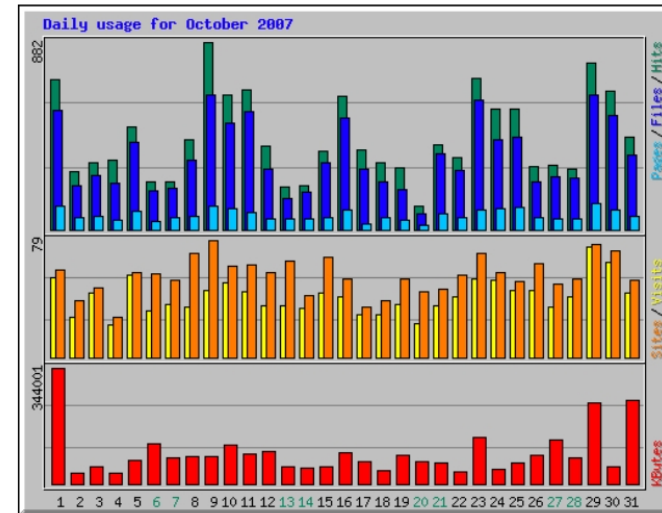
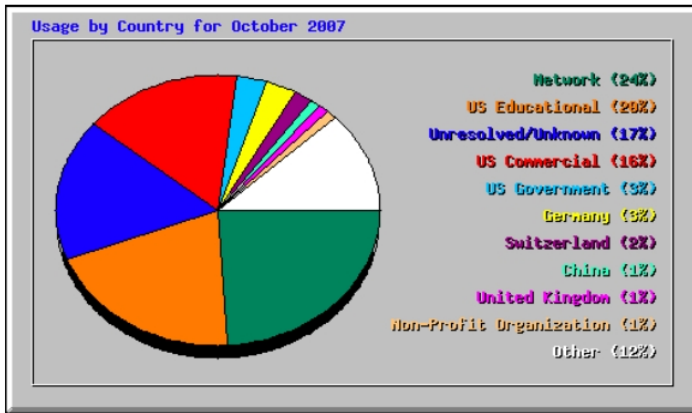


Summary by Month										
Month	Daily Avg				Monthly Totals					
	Hits	Files	Pages	Visits	Sites	KBytes	Visits	Pages	Files	Hits
Nov 2007	26	15	12	1	13	8878	13	137	171	296
Oct 2007	220	139	74	4	49	375201	126	2295	4310	6821
Sep 2007	130	79	47	2	42	225503	85	1414	2373	3918
Aug 2007	149	96	51	1	32	264384	55	1583	2978	4633
Jul 2007	164	92	58	1	19	211486	43	1515	2415	4269
Jun 2007	3	0	3	0	5	9	5	39	10	43
Totals						1085461	327	6983	12257	19980

Generated by [Webalizer Version 2.01](#)

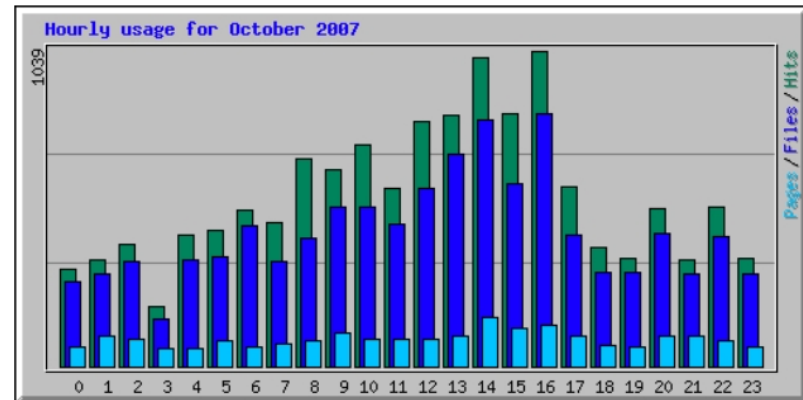
Web Statistics

Can be accessed in detail by month



Top 30 of 47 Total Countries

#	Hits		Files		KBytes		Country
1	3192	23.84%	2707	25.50%	1112612	38.84%	Network
2	2710	20.24%	1736	16.36%	245344	8.56%	US Educational
3	2235	16.69%	1999	18.83%	441296	15.40%	Unresolved/Unknown
4	2134	15.94%	1685	15.88%	870598	30.39%	US Commercial
5	461	3.44%	345	3.25%	17267	0.60%	US Government
6	429	3.20%	349	3.29%	23483	0.82%	Germany
7	243	1.81%	195	1.84%	24549	0.86%	Switzerland
8	147	1.10%	129	1.22%	2015	0.07%	China
9	136	1.02%	130	1.22%	18801	0.66%	United Kingdom
10	130	0.97%	81	0.76%	1255	0.04%	Non-Profit Organization
11	129	0.96%	128	1.21%	5280	0.18%	France
12	116	0.87%	114	1.07%	23303	0.81%	Japan
13	106	0.79%	102	0.96%	2348	0.08%	US Military
14	106	0.79%	84	0.79%	1705	0.06%	United States
15	96	0.72%	93	0.88%	1748	0.06%	Australia
16	92	0.69%	73	0.69%	5262	0.18%	Mexico
17	82	0.61%	76	0.72%	18539	0.65%	Romania
18	70	0.52%	69	0.65%	1613	0.06%	Canada
19	66	0.49%	63	0.59%	1501	0.05%	Brazil
20	66	0.49%	61	0.57%	863	0.03%	Czech Republic



PLASTIC merging with IMPACT, courtesy C.T. Russell

The screenshot shows a web browser window with the URL http://www-ssc.igpp.ucla.edu/forms/stereo/plot_PLASTIC.html. The browser's address bar and search bar are visible. The website has a yellow background and a navigation menu with buttons for visitor, research, library, education, news, missions, personnel, resources, and help. The main content area is titled "DATA" and features a "PLASTIC Data Heliocentric Phase" section. On the left, there is a sidebar with a list of data categories: ground-station, imp8, isee 1,2, isee3, polar mfe, polar orbit, solar wind, stereo, offline data, and data links. The main content area contains text explaining that users can plot or retrieve ASCII data from either STEREO/A or STEREO/B. It specifies that data is available in RTN coordinates for STEREO/A from February 14, 2007 (Day 45) to September 30, 2007 (Day 273), and for STEREO/B from March 1, 2007 (Day 60) to September 30, 2007 (Day 273). To the right of this text is a box with two sections: "PLOT:" and "ASCII:". The "PLOT:" section lists three options: "Low (10 minute)", "Med. Res (10 minute)", and "Full (10 minute)". The "ASCII:" section lists three options: "Low (10 minute)", "Med. Res (10 minute)", and "Full (10 minute)". Below this box, there are three sections for user selection: "Please select display format" with radio buttons for "Display plot", "Create postscript file", and "Create gif file"; "Please select coordinate system for vector quantities." with a radio button for "RTN"; and "Please select spacecraft to be examined." with radio buttons for "STEREO A" and "STEREO B".

UCLA - IGPP Stereo Data Server

http://www-ssc.igpp.ucla.edu/forms/stereo/plot_PLASTIC.html

Google

STEREO/PLA...rowse Data NSPIRES - S...ations Open Puffin Cam/... Puffin Cam STEREO - Pl... Hampshire Apple (118) Amazon eBay Yahoo! News (933)

visitor research library education news
missions personnel resources help

DATA

ground-station
imp8
isee 1,2
isee3
polar mfe
polar orbit
solar wind
stereo
offline data
data links

PLASTIC Data Heliocentric Phase

You may plot or retrieve ASCII data from either STEREO/A or STEREO/B.

Data are available in RTN coordinates as following:
STEREO/A - February 14, 2007 (Day 45) to September 30, 2007 (Day 273)
STEREO/B - March 1, 2007 (Day 60) to September 30, 2007 (Day 273).

PLOT:

- Low (10 minute)
- Med. Res (10 minute)
- Full (10 minute)

ASCII:

- Low (10 minute)
- Med. Res (10 minute)
- Full (10 minute)

Please select display format

Display plot Create postscript file Create gif file

Please select coordinate system for vector quantities.

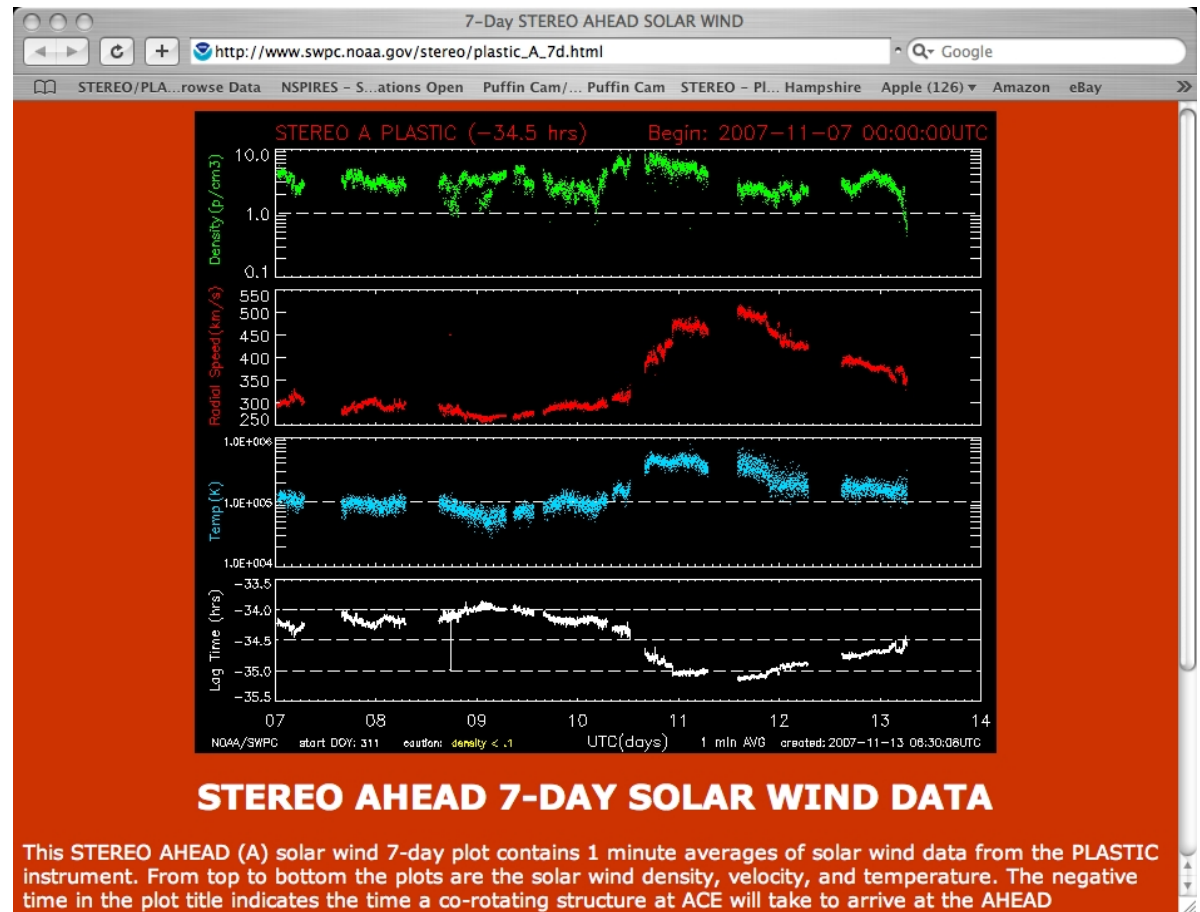
RTN

Please select spacecraft to be examined.

STEREO A **STEREO B**

PLASTIC Beacon Data

- PLASTIC also produces a 24/7 “Beacon” data product.
- Presentation given at NOAA SEL on PLASTIC Beacon data products (Kistler August 2007)
- Improved calibration table for beacon density calculations was implemented at SSC 10/23/07.



Operational Summary (since Mar07 SWG)

All systems are nominal.

Most significant operations during this period:

- **IDPU S/W Load 3.2.6 in June (B) and July (A). Some smaller issues have been since identified.**
- **Classifier table loads Sept/Oct (continuing to optimize PHA box definitions).**
- **Some significant data gaps due to calibration and test sequences (B) and safing for Leonids (A).**

PLASTIC FM1 and FM2 Operations

Gory Details

FM1 (A)

- 4/6/07 Changed S-channel switch threshold to 125 counts from 250 counts
- 5/10/07 Proton mode
- 6/13/07 Increased MCP V from 2850 to 2902V
- 6/26/07 Loaded IDPU s/w 3.2.6
- 7/19/07 Increased TAC2 threshold from 22 to 25 channels
- 9□/24 to 10/4/07 loaded classifier table
- 10/28, 29, 31/07 Shut off entrance system for Leonids

FM2 (B)

- 4/2/07 Increased MCP V from 2711 to 2789 V
- 4/2/07 Decreased MCP V to 2751 V
- 4/4/07 Increased MCP V to 2811 V
- 4/10/07 Increased MCP V to 2900 V
- 4/13/07 Increased MCP V to 2975 V
- 5/2/07 Increased MCP V to 3039 V
- 5/9/07 Increased MCP V to 3092 V
- 5/10/07 1 hr Proton Mode samples on each of 3 days
- 6/13/07 deflector voltages calibration - data gap from 1415 6/13 to 0430 6/14/07.
- 6/20/07 ESA voltage calibration
- 7/2/07 Loaded IDPU s/w 3.2.6
- 7/19/07 Increased TAC2 threshold from 22 to 25 channels
- 7/20/07 Set H moment and peak search array to SW_All
- 8/17/07 Set up SSD threshold tests and pha selection mode tests for days 232-234
- 9/11/07- 10/2/07 Loaded classifier table
- 10/22/07 Set up Proton mode for day 293
- Changed TAC2 threshold to 70 channels on day 293

EPO - UNH Partnership with Christa McAuliffe Planetarium and NASA



- UNH: Three STEREO PLASTIC undergraduate interns have become NASA Academy Summer interns!
- CMP: Spacetacular Saturday Astronomy Fair
- CMP: Superstellar Teen Nights
- CMP: Scholarships for Teacher Workshops
- CMP: ViewSpace (in progress)
- UNH: Jay Carroll (UNH STEREO Intern and NASA Academy alumnus) working as UNH STEREO liaison with CMP for implementing ViewSpace.