

IMPACT Update

SWG November, 2007

Submitted by Janet Luhmann and
Peter Schroeder
for the IMPACT Team

Instrument and/or Ops issues

- No instrument issues of general concern
- Ops issues:
 - moving SSL POC workstations to another secure room
 - in process of training a new IMPACT Ops backup person to stand in for Peter Schroeder when needed
 - Kristin Wortman move to APL
 - APL plans for resident POC

IMPACT Scientific Efforts

- CIR-accelerated energetic particles (SEPT-focus, Mueller-Mellin et al.; LET and SIT comparisons with ULEIS and SIS on ACE, Leske + Mason et al.)
- December 2006 events (LET-focus, comparisons with ACE, Mewaldt, Cohen, Weidenbeck et al.; CME/ICME relationship, Li, Liu, Lynch et al.)
- May 2007 event (SWEA, MAG ICME interpretation, Huttunen et al.; SEPs, LET et al., Mewaldt et al.)
- Suprathermal SEP electron events (STE observations, Wang et al.)
- Extended X-line Reconnection events (MAG, SWEA, PLASTIC-focus, Gosling et al.)
- Magnetic field structures: shocks, mirror mode waves, interplanetary flux enhancements, possible dust effects and comet signatures, ICMEs and SIR/CIRs (Russell, Jian et al.)
- Solar Wind Sources and Structure (SWEA, STE, MAG-focus, Sauvaud et al., Luhmann et al.)
- Solar wind modeling (Riley et al., Petrie et al., Lee et al.); CME/ICME modeling (Manchester et al., Linker et al.)

IMPACT Scientific Efforts (cont.)

- Energy spectra of quiet-time suprathermal ions (LET, SIT, Mewaldt+Mason et al.)
- ACR gradients with Ulysses and Voyager (LET, Cummings et al.)
- Foreshock and upstream waves (MAG, Blanco-Cano, Russell et al., SIT, Desai + Mason et al.)
- Magnetospheric observations (SWEA, MAG, Sauvaud et al.)
- Ulysses quadrature period + STEREO observations (Forsyth et al.)

Papers in Preparation/Published

“Die Sonne in 3-D”, R. Mueller-Mellin, *Astronomie Heute*, April 2007

“Radiation risks from large solar energetic particle events”, R.A. Mewaldt et al., *IGPP Workshop Proceedings*, 2007

“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”, Gosling et al., *GRL*, 2007.

“Shear-flow effects on magnetic field configuration within a solar wind reconnection exhaust”, Eriksson et al., *GRL*, submitted 2007.

“The spatial distribution of upstream ion events from the Earth’s bow shock measured by ACE, Wind and STEREO”, Desai et al., *JGR*, submitted 2007.

Space Science Reviews special issue (10 of 10 papers) essentially done or in press (see M. Kaiser presentation)

Papers in Preparation/Published (cont.)

– ICRC Proceedings in press that use STEREO data:

“Upstream events and recurrent CIR-accelerated particle events observed by STEREO-SEPT”, R. Mueller-Mellin et al.

“Observations of the December 2006 solar energetic particle events with the low energy telescope (LET) on STEREO”, R.A. Mewaldt et al.

“Observations of corotating interaction regions from STEREO and ACE”, R.A. Leske et al.

“Comparing observations and expectations of SEP composition in the two December 2006 events“, Cohen et al.

“Upstream events and recurrent CIR-accelerated particle events observed by STEREO/SEPT”, Mueller-Mellin et al.

“ “ von Rosenvinge et al.

“Unusual solar energetic proton fluxes at 1 AU within an interplanetary CME“, Mulligan et al.

“Cosmic ray helium intensities over the solar cycle from ACE“, G.A. DeNolfo et al.

Presentations/Abstracts involving IMPACT since last meeting

SHINE '07 July (2)

IUGG '07 July (5)

ICRC '07 August (5)

LWS Workshop September (1)

Fall AGU Meeting abstracts submitted (18)

IMPACT Team Meeting held: September 14, LASP, Boulder

next team meeting planned: Joint STEREO, ACE, WIND, Ulysses
multipoint in-situ science meeting at SSL Feb 19-21, 2008

IMPACT Data Status

As of November 13, 2007

Data Products Review

- Level 0 – telemetry files from APL, minimally processed
- Level 1 – primary science products, all science data at highest time resolution and scientific units, natively CDF format from UCB
- Level 2 – “key parameter” data, a subset of Level 1 products merged with PLASTIC and S/WAVES at lower time resolutions (minute, hour, day), available in ASCII format from UCLA
- Beacon – 24/7 near real time data set processed at GSFC intended for space weather purposes

Current Level 1 Data Holdings

Instrument	1 st Date (A)	1 st Date (B)	Last Date
MAG	Nov 2	Nov 2	Sep 30 (R)
SWEA	Oct 28	Oct 28	Sep 30 (R) / Present
STE	Oct 28	Oct 28	Present
LET	Nov 14	Nov 13	Sep 30 (R) / Present
SEPT	Dec 12	Dec 12	Aug 31 (R) / Present
SIT	Level 1 software being integrated		
HET	Level 1 software in development		

Overall Data Portal Info

- Primary site with data browsers, instrument descriptions, etc.:
<http://sprg.ssl.berkeley.edu/impact>
- Pre-validated Level 1 data access (password required) at:
<http://stereo.ssl.berkeley.edu/l1unvalid>
- Level 0 and validated Level 1 data at:
<http://stereo.ssl.berkeley.edu>
- Summary plots available at:
<http://stereo.ssl.berkeley.edu/sumplots>

Outstanding Level 1 Data Issues

- MAG – the STA X sensor has been experiencing very short duration (fraction of a second) “glitches” with magnitude of about $\frac{1}{2}$ nT. These glitches will be removed in a future data release.
- SWEA – currently, full 3D distributions are available as are rough PAD’s (but are not yet in solar wind frame). Moments almost done.
- SEPT – lowest energy electron bins sometimes have some ion contamination which will be calibrated out in future versions (see caveat on L1 data page)
- STE – raw spectra in counts are available only

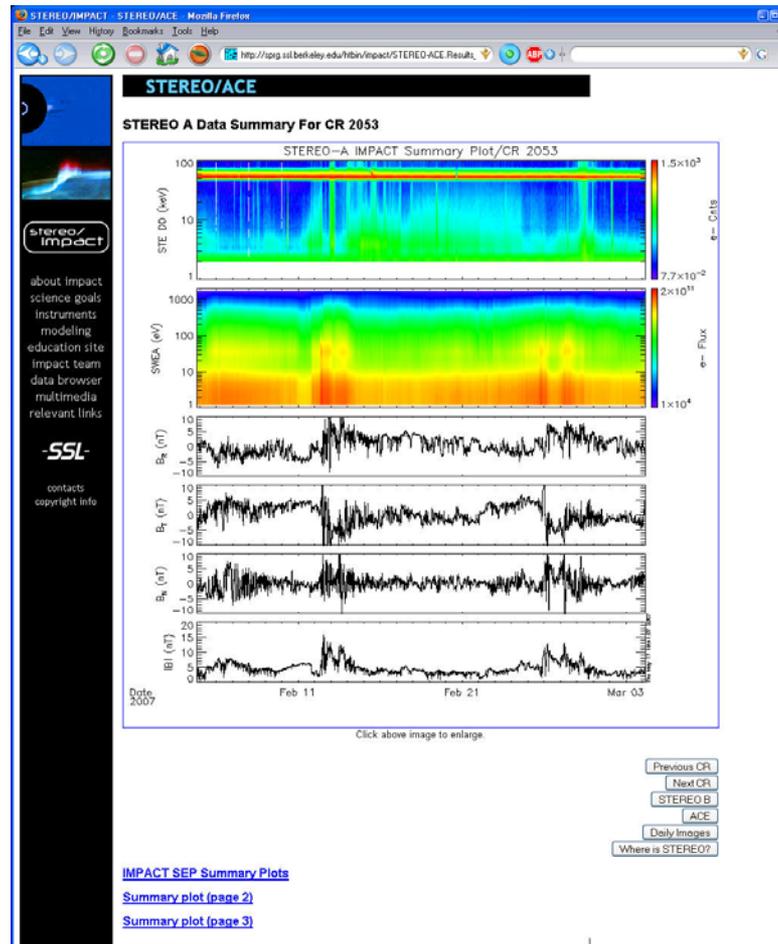
More Level 1 Data Issues

- LET – software in very good shape, some proton and helium data from launch to early March needs reprocessing
- SIT – working on integrating Co-I provided software
- HET – working with Co-I on developing software
- Working on CDF to ASCII translations for all these products

IMPACT Data Browsers

- Static plot browser currently available with connections to images, models, SWAVES, and ACE/Wind at http://sprg.ssl.berkeley.edu/impact/data_browser.html
- MAG ascii Level-1 data and plots at <http://www-ssc.igpp.ucla.edu/forms/stereo/heliocentric.html>
- Similar Level 2 browser (merged in-situ Key Parameter ascii data) in beta testing stage
- LET ascii Level-1 data and plots at http://www.srl.caltech.edu/STEREO/Level1/LET_public.html
- CDAWeb-like browser/plotter (but with greater functionality) is a goal/desire
- IMPACT data will soon be available through CDAWeb and the VHO
- Beacon data browser at SSC

Static Data Browser Sample Plots



STEREO/IMPACT - CR Info - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://stereo.ssl.berkeley.edu/sslstings/carr_rot/cr2053/

STEREO/ACE

CR2053

Carrington Rotation models based on GONG magnetograms.
 Model results and Images from Gordon Petrie, NSO <http://gong.nso.edu/data/magnmag/index.html>

Stills of Synoptic Images

Magnetogram Synoptic Coronal Hole Plot

Synoptic Field Plot Synoptic Ecliptic Plane Field Plot

Movies

CR Plot (STEREO A)

CR Plot (STEREO B)

CR Plot (ACE)

CR Plot (WIND)

US Pacific Wed 13:34 US Eastern Wed 16:34 GMT/UTC Wed 20:34 Central European Time Wed 22:34 Done



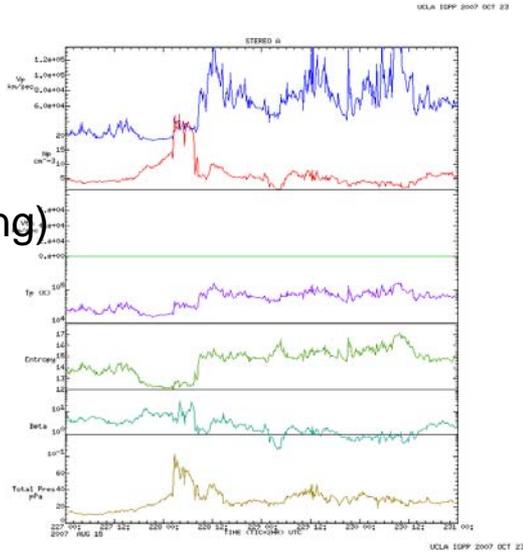
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 science goals
 instruments
 modeling
 education site
 impact team
 data
 multimedia
 relevant links



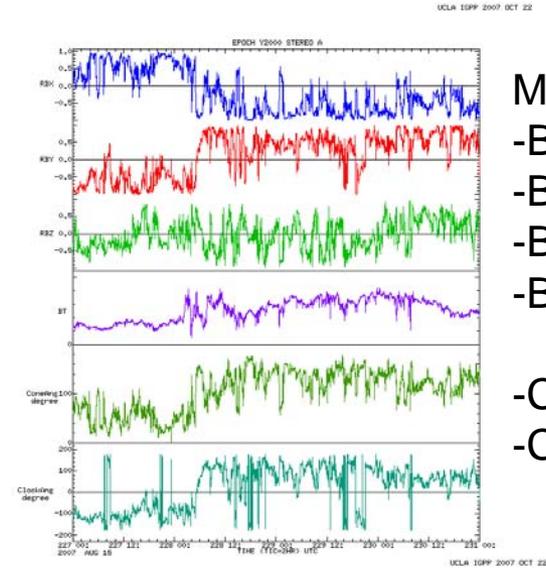
contacts
 copyright info

Samples of Merged 10-min PLASTIC Plasma and IMPACT MAG data and derived quantities from the beta test Level-2 Key Parameter Server Website

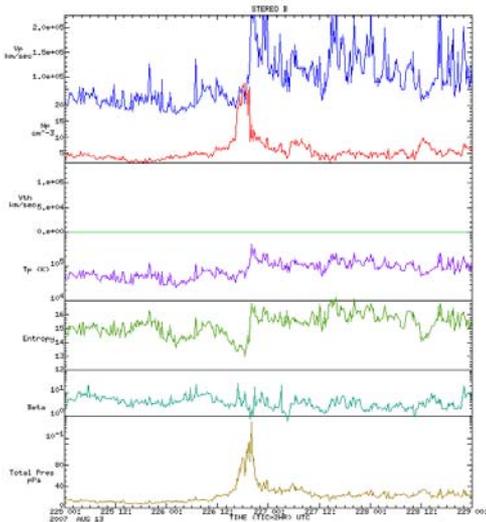
- PLASTIC
- V
 - N
 - vth (coming)
 - Tp
 - Entropy w/MAG:
 - Beta
 - Total Pressure



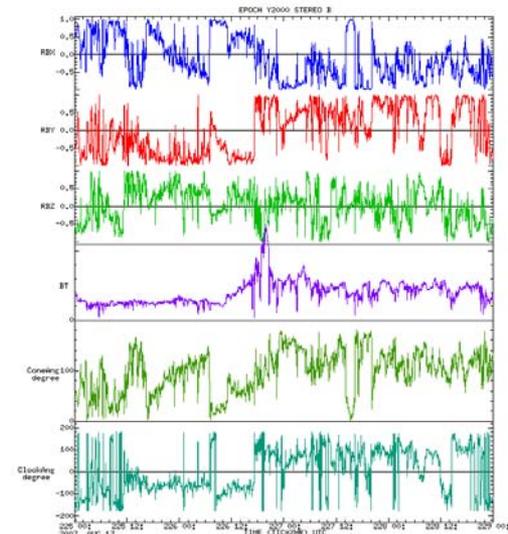
STEREO-A



- MAG
- Br
 - Bt
 - Bn
 - Btot
 - Cone Ang.
 - Clock Ang.

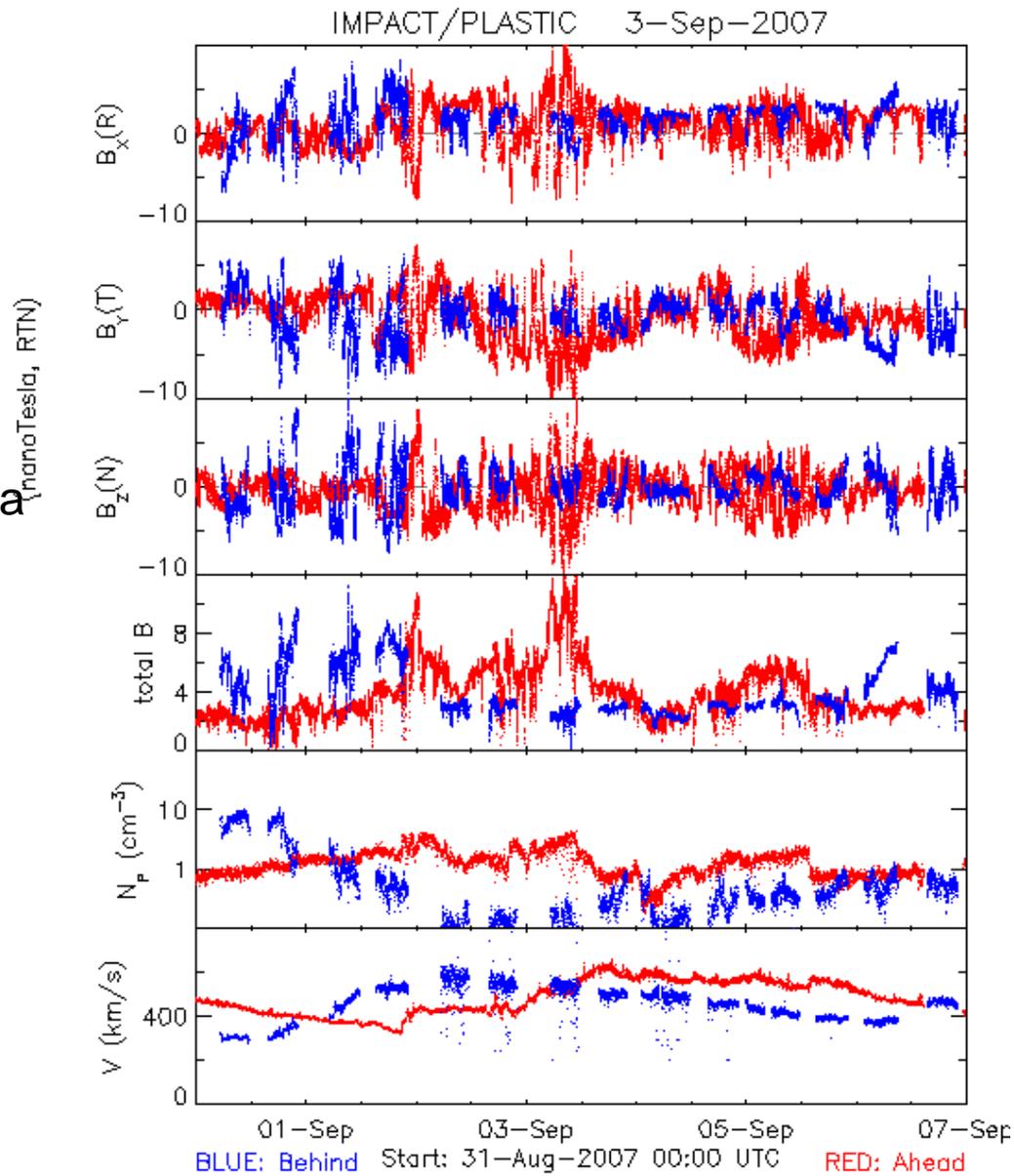


STEREO-B

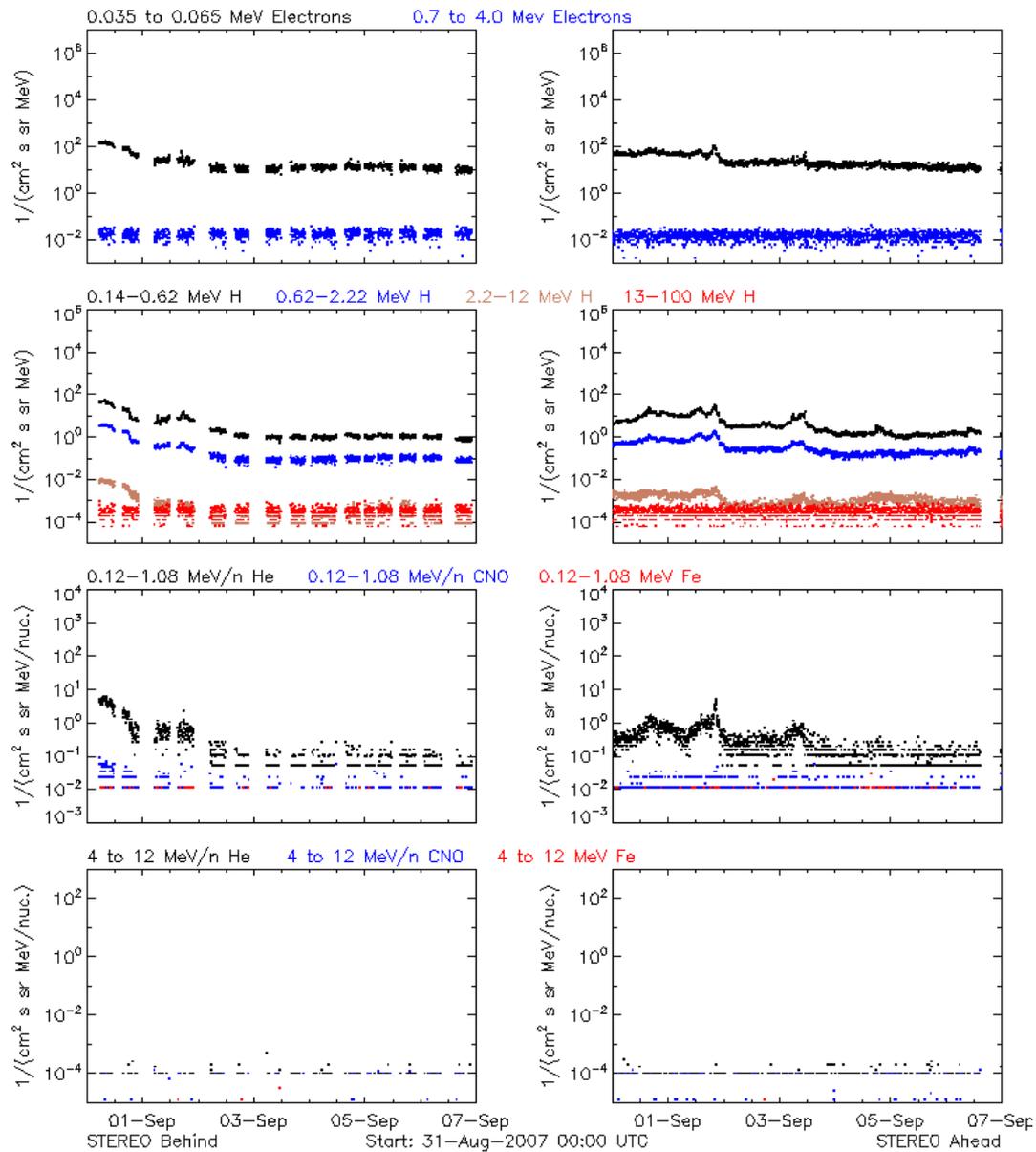


(LET data to be added next)

Sample beacon
Plot of MAG data



Sample beacon Plot of SEP data



Sample Comparison of MAG beacon and Level 1 data

UCLA IGPP 2007 NOV 2

