STEREO In situ Data Access and Tools

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IMPACT 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
- Level 3 – event lists
- Beacon – 24/7 near real time data set processed at GSFC intended for space weather purposes
## Current IMPACT Level 1 Data Holdings

<table>
<thead>
<tr>
<th>Instrument</th>
<th>1&lt;sup&gt;st&lt;/sup&gt; Date (A)</th>
<th>1&lt;sup&gt;st&lt;/sup&gt; Date (B)</th>
<th>Last Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAG</td>
<td>2006 Nov 2</td>
<td>2006 Nov 2</td>
<td>2008 Mar 31</td>
</tr>
<tr>
<td>LET</td>
<td>2006 Nov 14</td>
<td>2006 Nov 13</td>
<td>2008 Jan 31</td>
</tr>
<tr>
<td>SEPT</td>
<td>2006 Dec 12</td>
<td>2006 Dec 12</td>
<td>2008 Jan 31</td>
</tr>
<tr>
<td>HET</td>
<td>15 minutes averages through 2008 Jan 31</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Overall IMPACT Data Portal Info

- Primary site with data browsers, instrument descriptions, etc.: http://sprg.ssl.berkeley.edu/impact
- Validated Level 1 data (no password required) at: http://stereo.ssl.berkeley.edu
- Pre-validated Level 1 data access (password required) at: http://stereo.ssl.berkeley.edu/l1unvalidated
The VHO

- [http://vho.nasa.gov](http://vho.nasa.gov)
- Unified and powerful access to ACE, Wind, STEREO and other heliospheric data sets
- Complex queries possible including searches based on physical parameters as well as time, spacecraft location, etc.
Web Interface

- Professional web design
- Update/News info
- Collaboration tools
VHO Web Interface – Query Builder

Searches by:

Time
- Date/Time

S/C Location
- GSE/GSM/HCI

Measurement Type
- e.g., magnetic field, thermal plasma, energetic particles

Parameter Values

Select query parameters
Select time period
Select logical operation
Query Results

Time periods satisfying the query are returned

Matching product identified

Links to the data granules provided

Links to the SPASE metadata provided
Instrument Metadata

The magnetic field experiment on WIND provides data for studies of a broad range of scales of structures and fluctuation characteristics of the interplanetary magnetic field throughout the mission, and, where appropriate, relate them to the states and dynamics of the magnetosphere. The basic instrument of the Magnetic Field Investigation (MFI) on the WIND Spacecraft is a boom-mounted dual triaxial fluxgate magnetometer and associated electronics. The dual configuration provides redundancy and also permits accurate removal of the dipolar portion of the spacecraft magnetic field. The instrument provides: (1) near real-time data at nominally one vector per 92 s as key parameter data for broad dissemination, (2) rapid data at 10.9 vectors/s for standard analysis, (3) occasionally, standard (SS) memory data and Fast Fourier Transform data (FFT), both based on 44 vectors. These measurements are precise (0.02%), accurate, ultrasensitive (0.008 nT/step quantization), and where the sensor noise level is 0.006 nT rms for 0-10 Hz. The digital processing unit utilizes a 12-bit microprocessor controlled analog-to-digital converter. The instrument features a very wide dynamic range of measurement capability, from 4 nT to 5.5 T per axis in eight discrete ranges. (The upper range permits complete testing in the Earth's field.) Power spectral density elements are transmitted to the ground as fast as once every 23 s (high range). 2.7 min of SS memory time series data, triggered automatically by pre-set command, requires type: 5.1 hours for transmission. Standard data products are the following vector field averages: 0.01 s, 0.03 s, 0.05 s, 0.09 s (where in standard mode), 3 s, 1 min, and 1 hour, in both GSE and GSM as well as the FFT spectral elements. High instrument reliability is obtained by the use of fully redundant systems and extremely conservative designs. The instrument was turned on 1994-11-11. For more details, see Lepping, R. P., et al., The WIND Magnetic Field Investigation, Space Science Reviews, 71, 207-216.

Human readable, formatted metadata

Links to SPASE XML files
# Product Metadata

## Data Product: WIND MFI Version 3 Data

<table>
<thead>
<tr>
<th>Product ID</th>
<th>spase://VHO/NumericalData/WIND/MFI/v3_PT035 XML</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>WIND MFI Version 3 Data</td>
</tr>
<tr>
<td>Description</td>
<td>WIND MFI composite data. The files contain multiple time resolution data: 3-second, 1-minute, and 1-hour. Calibrated science quality data.</td>
</tr>
<tr>
<td>Additional Information</td>
<td>WIND Magnetic Field Investigation (MFI) Home Page  A web site hosting instrument information as well as web utilities for plotting and downloading data</td>
</tr>
<tr>
<td>Acknowledgement</td>
<td>User will acknowledge the WIND MFI instrument team in any publication resulting from the use of these data.</td>
</tr>
</tbody>
</table>

### Contact

<table>
<thead>
<tr>
<th>Role</th>
<th>Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Principal investigator</td>
<td>Dr. Ronald P. Lepping [XML]</td>
</tr>
<tr>
<td>2. Data producer</td>
<td>Dr. Adam Szabo [XML]</td>
</tr>
</tbody>
</table>

### Release date

2007-05-31 20:36:59

### Repository

<table>
<thead>
<tr>
<th>Name</th>
<th>WIND Magnetic Field Investigation (MFI) Data Repository [XML]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability</td>
<td>Online</td>
</tr>
<tr>
<td>Access rights</td>
<td>Open</td>
</tr>
<tr>
<td>URL</td>
<td>Download of WIND MFI v3 data</td>
</tr>
<tr>
<td>Format</td>
<td>CDF</td>
</tr>
<tr>
<td>Encoding</td>
<td>None</td>
</tr>
</tbody>
</table>

### Provider processing level

Level 2

### Provider resource name

WIND MFI v3 Data

### Provider version

3

### Instrument

WIND Magnetic Field Investigation [XML]

### Measurement type

Magnetic field

### Temporal description

<table>
<thead>
<tr>
<th>Start date</th>
<th>1994-11-12 15:00:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative end date</td>
<td>POD</td>
</tr>
</tbody>
</table>

### Observed regions

Earth, Magnetosheath
Earth, Magnetosphere
Earth, Magnetosheath Magnetotail
Earth, Magnetosphere Main
Heliosphere, Inner
Heliospheric Nose Tail
Parameter Information

Detailed information provided for all parameters inside the returned data files.

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Granule Metadata

Information provided on each data granule and checksum for download integrity.

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File Information (Granule)

- **Granule ID**: space://WIND/Granule/WIND/MFI/v3_PT03S/wi_h0_mfi_19980102_v03
- **Product name**: WIND MFI Version 3 Data
- **Start date**: 1998-01-02 00:00:01
- **Stop date**: 1998-01-02 23:59:59
- **Data download**: wi_h0_mfi_19980102_v03.cdf
- **MD5 checksum**: 75e444b12163d357d84257259e7f58e
- **File size**: 2613414 bytes
Data Browsers

- Static plot browser currently available with connections to images, models, SWAVES, and ACE/Wind
- Level 2 browser in beta stages
- CDAWeb-like browser (but with greater functionality) is in early stages
- IMPACT data will soon be available through CDAWeb and the VHO
Static Data Browser
Built Using TPLOT

- TPLOT is a library of IDL routines used for over 12 years created at UC-Berkeley
- TPLOT and IMPACT-related libraries available at: http://stereo.ssl.berkeley.edu
- Optimized for in situ “line” and “spectrogram” plotting, but also includes 3D mapping capabilities (useful for SWEA or PLASTIC-like distribution functions)
- However, all our Level 1 CDF data products are self-documenting, and general CDF reading libraries are available for many kinds of data analysis environments
- Many libraries and ASCII translation tools are accessible at: http://cdf.gsfc.nasa.gov