WIND MISSION ARCHIVE PLAN

Early in its mission, *Wind* and the other GGS spacecraft relied on a very capable and extensive science operations center, the Science Planning and Operations Facility (SPOF). The SPOF was responsible for the collecting, distribution and active archiving of all level zero (LZ) and ancillary data products. The SPOF also ran daily the instrument team provided data processing software to produce quick turn around, publicly available data, termed Key Parameters (KPs). The SPOF also provided science planning and software maintenance services.

With the passage of time, and with reducing funding levels, The SPOF had to be turned off and most of its functions were passed on to the instrument teams and to a small operation, the *Polar-Wind-Geotail* or PWG system, that continued to perform some LZ and KP functions. This unavoidable decentralization resulted in a degree of unevenness and disparity between the various *Wind* instrument data services. To solve this problem, key *Wind* instrument team members rallied around the new distributed Heliophysics Data Environment (HDE) concept and became funding members of the Virtual Heliospheric Observatory (VHO). The VHO provides a single point of entry for data location without the costly necessity of a dedicated science operations center. The VHO also encourages its members to adopt the common SPASE dictionary based metadata standard thus providing the user community an even level of descriptions of instruments and data products.

The development of the HDE and VHO is ongoing, and not every *Wind* data product is yet at the level where the team would like it to be. Nevertheless, here we describe our current status and our plans to present the *Wind* data products independently usable thus achieving their full science potential.

Mission Operations Center

The *Wind* Mission Operations Center (MOC) resides at Goddard. It is currently a joint activity with *Polar* and *Geotail* under the Space Science Mission Operations (SSMO) contract. After the April, 2008 retirement of the *Polar* spacecraft, maintaining this system is not cost effective and plans are already on their way to implement a Multi-Mission Operations Center (MMOC), also at Goddard, that joins *Wind* with ACE and SOHO. The functionality of the new MMOC will be the same as that of the current MOC.

The primary responsibility of the MOC is spacecraft commanding, trend and anomaly analysis, DSN scheduling, the maintenance of *Wind* Near-Real-Time (NRT) passes and LZ generation for each instrument and spacecraft housekeeping. In addition, the Goddard flight dynamics facility provides orbit and attitude solutions to the MOC. The MOC, in turn, sends all of these data products daily to the PWG system.

After the transition to the MMOC, we do not anticipate making any further changes to the *Wind* mission operations.

The PWG System

The Polar-Wind-Geotail (PWG) system handles the active archiving of LZ and ancillary files and their distribution to the instrument teams and various active archives. The PWG system also

performs the rapid KP data production for all instruments. It resides also at Goddard but with the team of the project scientist. The PWG system has been streamlined onto only two computers (a data server and a data processor) (with hot spares) and is fully automated to eliminate the need for data technicians. The system is maintained by one civil service IT engineer at a fraction of FTE. This system also serves as the interface to the *Wind* NRT data stream, which is real time processed data during the daily ~2 hour long spacecraft telemetry contact times. This NRT data is available in numerical and graphical format at: http://pwg.gsfc.nasa.gov/windnrt/.

The PWG system distributes the instrument and spacecraft housekeeping LZ files to the instrument teams via FTP and by direct mailing of DVDs. All of these LZ and orbit/attitude files are also publicly accessible at ftp://pwgdata.gsfc.nasa.gov/pub/. Only the most recent 60 days are served in uncompressed format, but the whole mission is archived in GZip compression. Even though the deep archival of these data files are handled by NSSDC, the PWG system also backs up all LZ data at two physical locations and onto tapes, CDs and DVDs. It should be noted that the whole *Wind* mission to date requires only 300GB of storage for the LZ data, so the backup requirements are not overwhelming.

At the beginning of the mission, all *Wind* instrument teams had to supply software to automatically process some portion of their data into science data products, the KP data. Even though the KP data is clearly not the best quality data the instrument teams produce, because it is always available publicly within 24 hours of observation, it enjoys great popularity. The PWG system maintains this software library, with occasional support (as needed) from the instrument teams and automatically places all the KP data on http://cdaweb.gsfc.nasa.gov. A more detailed description of the various KP products is given at the instrument sections below.

The PWG system also keeps the Satellite Situation Center (SSCWeb) up to date with orbit information (http://sscweb.gsfc.nasa.gov). Thus all orbit graphics generated on SSCWeb are always up to date.

At this point, the only further development of the PWG system we are still planning is the backup capability to parse the instrument LZ files directly from the instrument telemetry, a function currently carried out by the MOC. Should further cuts be necessary at the MOC, we will investigate whether this function could be transferred to the PWG system at a reduced cost.

Instrument Data

The bulk of the instrument data processing and data dissemination takes place at the instrument sites. Next, each instrument team's effort is described. To aid the user community, we are developing a new *Wind* project web page (http://wind.nasa.gov) that identifies the entry point for each instrument data environment and provides some degree of common documentation. However, our long term goal is to fully integrate all of the *Wind* data products into the VHO, thus making the data not only easy to find but also uniformly described. The current status of *Wind* products at the VHO are also summarized at a later section. Finally, under an optimal funded scenario (described in the proposal), we propose to develop a *Wind* Science Center as a small augmentation of the STEREO IMPACT Data Center at UC Berkeley. This would not just collocate select and relevant data products with their STEREO counterparts but would also present them in the exact same format as the STEREO IMPACT data. Thus the *Wind* data products would be readily usable in the STEREO software environment.

SWE Ions

Documentation. The SWE Faraday Cup (FC) sub-system was designed to measure solar wind thermal protons and positive ions. The physical sensor is completely described in the *Space Science Review* article *Ogilvie et al*. [1995]. This article was also reproduced in the *Global Geospace Mission* book and portions of it are available through the *Wind* project web page (http://wind.nasa.gov). Further, in depth discussion of FC ground and in-flight calibrations can be found in a chapter of an ISSI book authored by Peter Wurz currently in the printing process. Once permission is secured, this chapter will be also available at the *Wind* project web page.

The data production procedures are described by *Ogilvie et al*. [1995], but a much more detailed discussion is provided by J. Kasper in his PhD dissertation. The relevant chapters are reproduced on the *Wind* project web page. While error analysis results are included in each FC data file, the systematic uncertainties of the measurements, calibrated against other *Wind* instruments and based on basic physical principles, are discussed in *Kasper et al.* [2006]. This paper is also available on the *Wind* project web page.

Data Products. The PWG system, on receipt of the LZ data, immediately processes a KP data product for SWE/FC. This automated procedure uses a convected isotropic Maxwellian to fit to the reduced distribution functions collected by the FC. These 92-second time resolution ASCII data files are available to the public within 24 hours of the observations at the MIT instrument web site (http://web.mit.edu/space/www/wind/wind_data.html) and at CDAWeb (http://cdaweb.gsfc.nasa.gov). A despiked version of this data is also available at NSSDC's FTP Helper (http://ftpbrowser.gsfc.nasa.gov). 1-hour averages of this data is also available at the MIT instrument page. While the KP products were originally designed as browse, quick look data, the quality proved to be so high that this data product became the primary science level data product of the FC sub-system.

Recently, a new data production algorithm was developed that employs a bi-Maxwellian fit and obtains anisotropic temperatures for protons and a separate fit for Alpha particles. The resulting data product (designated H1 by CDAWeb), also contains the simpler moment computations primarily to allow direct comparison with the ACE SWEPAM proton data. This 92-second time resolution data can be located in ASCII format at the MIT web page and at FTPHelper, and in CDF format at CDAWeb. The whole mission, since 1994 has been reprocessed with this new algorithm and is available generally till ~6 months behind real time as it requires the final calibrated MFI magnetic field data that needs several months to be computed.

Two new FC data products are being considered for development. During most of its 92-second cycle through the energy steps, the rotating FC data can be used to generate 3-second time resolution proton measurements. Test runs have demonstrated this algorithm, but since this is intrinsically not a continuous data product and since the 3DP instrument already produces 3-second proton data, the generation of this new FC data product is of low priority and is primarily a backup to the 3DP data. Of much higher priority is the generation of the reduced distribution functions in physical units with all instrument effects folded in. Obviously, this data exists (this is what is fitted for the KP and H1 data) but is internal to the data production software. Due to its complexity on a rotating platform, this information was originally not planned to be publicly distributed. However, recently – encouraged by the development of new metadata standards that can handle complex data sets – the generation of the reduced distribution functions was reinvestigated. This would be the most fundamental and complete presentation of the FC

measurements. It is however, a major undertaking, and at the current low funding level of the instruments, it proceeds at a very slow pace. It is our plan that within two years the first test data products would be available.

All of the FC data products are archived at the SPDF active archive and at NSSDC. The FC data products are summarized in the table below.

Data Product	Time Res.	Time Coverage	Format	Location
KP protons (K0)	92 sec	1994/11/17-Present	ASCII	MIT, FTPHelper
			CDF	CDAWeb
KP protons	1 hour	1994/11/17-Present	ASCII	MIT
Bi-Maxwellian (H1)	92 sec	1995/1/1- (~6 mo lag)	ASCII	MIT
			CDF	CDAWeb

Locations:
MIT: http://web.mit.edu/space/www/wind/wind_data.html
FTPHelper: http://ftpbrowser.gsfc.nasa.gov
CDAWeb: http://cdaweb.gsfc.nasa.gov

SWE Electrons

Documentation. The SWE electron sub-system consists of two electrostatic analyzers, the vector spectrometer (VEIS) and the Strahl spectrometer. They were designed to measure the solar wind electron distribution function. The sensors are fully described by *Ogilvie et al*. [1995] and the instrument description portion of this paper can also be found at the *Wind* project web page (http://wind.nasa.gov).

Due to a high voltage supply failure the last available data from the VEIS detector is May 31, 2001. Since the Strahl detector has very similar capabilities (though it was used in a different manner at the beginning of the mission) it was reprogrammed and the ground software rewritten to recover the electron moment and pitch angle measurements originally supplied by VEIS. The SWE Space Science Review article has been updated with these modifications and is available at the *Wind* project page along with a technical description of the new ground software algorithms. Moreover, the headers of the CDF data files have extensive documentation for each data product.

Data Products. There are four SWE electron data products: (1) electron moments containing electron density, velocity, temperature and heat flux parameters; (2) the pitch angle files providing electron fluxes at 30 directional bins relative to the instantaneous magnetic field direction at 13 different energy levels; (3) the averaged pitch angle data product with various aggregate averages formed from the complete pitch angle data; (4) and finally the strahl data with higher angular resolution electron pitch angle observations near the magnetic field direction. Starting on Aug 16, 2002, all of these four data products are generated by the new production software based on the reprogrammed Strahl detector measurements. In addition, the electron 'moments' are no longer the result of integral moment calculations but estimated from the fitting of a single kappa distribution function to both the core and halo components. This new fitting technique, promising to provide higher quality estimates, is still undergoing testing. Therefore, currently all of the new data products reside exclusively on the Goddard SWE ftp site, where it is available publicly. Once all of the new data products are fully validated, they will be transferred to CDAWeb just as the original electron products have been. The current availability of the SWE electron data products is summarized in the table below.

Data Product	Time Res.	Time Coverage	Format	Location
Moments (H0)	12 sec	1994/12/29-2001/5/31	CDF	CDAWeb, SWEFTP
Pitch angle	12 sec	1994/12/29-2001/5/31	CDF, binary	SWEFTP
Averaged pitch angle	12 sec	1994/12/29-2001/5/31	CDF, binary	SWEFTP
Strahl	12 sec	1994/12/29-2001/5/31	CDF, binary	SWEFTP
New 'moments'	12-15 sec	2002/8/16-Present	CDF, binary	SWEFTP
New pitch angle	12-15 sec	2002/8/16-Present	CDF, binary	SWEFTP
New averaged pitch angle	12-15 sec	2002/8/16-Present	CDF, binary	SWEFTP
New strahl	12-15 sec	2002/8/16-Present	CDF, binary	SWEFTP

Locations:
SWEFTP: ftp://windswe.gsfc.nasa.gov/pub
CDAWeb: http://cdaweb.gsfc.nasa.gov

3DP

Documentation. The *Wind* 3DP instrument consists of six different sensors. There are two electron (EESA) and two ion (PESA) electrostatic analyzers with different geometrical factors and fields-of-view. This way, they can cover the wide dynamic range from 3 eV to 30 keV that encompasses the bulk of the solar wind and much lower density suprathermal populations. There are also a pair of solid state telescopes (SST) the measure electrons with energies up to 400 keV and protons with energies up to 6 MeV. The instrument is fully described by *Lin et al.* [1995]. The instrument description portion of this paper is reproduced at the *Wind* project web site.

The PESA and EESA detectors are swept over their energy range typically 32 times per the 3-second spacecraft spin rate to produce very high time resolution 3D distributions. This process results in a very large volume of data that cannot all be telemetered to the ground. Thus, extensive use is made of on-board processing capabilities. As a result a large number of 3DP data products were developed, some based on on-board processing and some generated on the ground. Some documentation of these data products exist at the 3DP instrument web page (http://sprg.ssl.berkeley.edu/wind3dp/). To improve the documentation of the various 3DP data products, they were selected as test cases for the newly developing VHO. Extensive 3DP metadata can already be publicly located there (http://vho.nasa.gov). Further data product descriptions are also being collected at the *Wind* project web page (http://wind.nasa.gov).

Data Products. As most *Wind* instruments, 3DP team has provided a KP production software to be run automatically at the PWG system. This data product contains electron and ion fluxes at seven energies for each particle and some basic moment computations and can be found at CDAWeb for the whole duration of the mission. Much more popular is the unique 3 second time resolution proton moment (PM) data. Even though it is computed on-board the spacecraft, as a result of ever improving calibration tables uploaded, it has proven very reliable. It can be accessed for the complete mission at both the 3DP instrument site and at CDAWeb. In addition, the 24-second times resolution ion omni-directional fluxes and the 98-second electron omni-directional fluxes can also be obtained at both the 3DP and CDAWeb sites. Electron and proton pitch angle distributions and SST energy spectra are currently available only at the 3DP site. However, work is already ongoing to transfer these data sets also to CDAweb.

Even though the 3DP data products are in general very high quality and enjoy widespread scientific use, the accompanying documentation is recognized to be very limited. Therefore, in conjunction with the VHO development effort, a program has been initiated to fully document

the wide range of 3DP data products. This will take the form of SPASE-based, VHO compliant metadata, but also of text files describing the various algorithms and calibrations used and will be posted at the *Wind* project web page. Also, as mentioned earlier, all 3DP data products will be synchronized shortly with CDAWeb satisfying the archiving requirements. Since 3DP relies on extensive on-board computations, there is no single data product that captures all of the 3DP observations and could be considered the fundamental, highest detail data. Therefore, all the various data products have to be fully documented and archived. The current status of the 3DP data products is listed in the table below. All of them cover the full mission duration from 1994/11/15 to present.

Data Product	Time Res.	Format	Location
KP	92 sec	CDF	CDAWeb
PM on-board proton moments	3 sec	CDF	CDAWeb, Berkeley
ELSP electron omni directional fluxes	98 sec	CDF	CDAWeb, Berkeley
PLSP proton omni directional fluxes	24 sec	CDF	CDAWeb, Berkeley
ELPD electron pitch angles	98 sec	CDF	Berkeley
PLPD proton pitch angles	24 sec	CDF	Berkeley
SFSP SST electron energy spectra	12 sec	CDF	Berkeley
SOSP SST proton energy spectra	12 sec	CDF	Berkeley

Locations:
Berkeley: http://sprg.ssl.berkeley.edu/wind3dp
CDAWeb: http://cdaweb.gsfc.nasa.gov

SMS

Documentation. The *Wind* SMS instrument suite is composed of three separate instruments. The SupraThermal Ion Composition Spectrometer (STICS) determines mass, mass per charge, and energy for ions in the energy range from 6-230 keV/e. The high resolution mass spectrometer (MASS) determines elemental and isotopic abundances from 0.5 to 12 keV/e. Finally, the Solar Wind Ion Composition Spectrometer (SWICS) experienced a failure of the "stop" MCP and hence has reduced capabilities. Initially, it provided mass, charge, and energy for ions in the energy range of 0.5 to 30 keV/e. However, since the failure the particles mass and charge cannot be uniquely determined and no data is currently processed from it. These instruments are fully described by *Gloeckler et al.* [1995]. Additional information is provided at the SMS University of Maryland web site (http://space.umd.edu/wind/). Finally, data product release notes are available at the *Wind* project web page (http://wind.nasa.gov).

Data Products. Till the failure of the SWICS instrument (May 27, 2000), combined SWICS and STICS KP files were generated that contain alpha particle information along with some carbon and oxygen abundances and temperatures. This data product is still publicly available from CDAWeb. Since the SWICS failure, a lot of time went into determining how to properly use the other two sensors by themselves. A new software system has been developed which automates many data analysis functions previously done manually. This system first simultaneously assigns events to specific ion species, removing any overlap and using the statistical properties of the measurements to maximum advantage. It then uses these assigned events to construct phase space density distribution functions and corrects these for the effects of instrument efficiency and sampling geometry. Finally, it outputs these distribution functions, error estimates, and count rates for each ion along with many intermediate products that facilitate detailed analysis. The

software can perform arbitrary time integrations of the data and can optionally use an inversion method to remove overlap among ions in the instrument measurement space. Development of this system is in the data validation and optimization stage, with the first scientific analyses already underway. Daily averages of the proton and alpha particle phase space density distribution functions for the whole mission is already publicly available through the *Wind* project web page. In addition, hourly resolution STICS and MASS energy spectra for select days throughout the mission are available in digital and graphical formats from the University of Michigan page (http://solar-heliospheric.engin.umich.edu/mission_db/spectra.php?craft=2). Further work is under way to produce more data products. The current status of the SMS data products is summarized in the table below.

Data Product	Time Res.	Time Coverage	Format	Location
KP SWICS+STICS	4 hours	1994/12/12-2000/5/27	CDF	CDAWeb
STICS p+a distr. Func.	1 day	1995/1/1-200712/31	ASCII	WIND Project
STICS+MASS spectra	1 hour	Select days	ASCII	UMichigan

Locations:
CDAWeb: http://cdaweb.gsfc.nasa.gov
Wind Project: http://wind.nasa.gov
UMichigan: http://solar-heliospheric.engin.umich.edu/mission_db/spectra.php?craft=2

EPACT

Documentation. The Energetic Particles: Acceleration, Composition and Transport (EPACT) investigation consists of multiple telescopes. The highest energy telescopes (APE and IT) have failed early in the mission. However, the Low Energy Matrix Telescope (LEMT) covering energies in the 1-10 MeV/nuc range and the Suprathermal Energetic Particle telescope (STEP) measuring ions heavier than protons in the 20 keV - ~1 MeV/nuc range still continue to provide valuable data. These instruments have been described by *Von Rosenvinge et al.* [1995]. The instrument portion of this paper is reproduced at the *Wind* project web page (http://wind.nasa.gov). Additional instrument information is available at the instrument web page (http://lheawww.gsfc.nasa.gov/docs/gamcosray/lecr/EPACT/epact.html). The newly generated sectored count data is described also at the *Wind* project web page.

Data Products. Fluxes for a select number of ions (helium, oxygen, iron and combined CNO) in energy bins below 1 Mev/nuc and averaged over 92 seconds are publicly available for the whole mission in KP files at CDAWeb. As a quick look at this data reveals, the count rate of these energetic particles is very low, thus most of the KP data points are identically zero. In past, select time periods with intense particle events were manually analyzed and higher level data products generated from them. These were available on request to the public. More recently, a systematic search for events with non-zero count rates have been undertaken, and 41 such several day long periods identified in the 1997-2003 time range. For these intervals hourly resolution omnidirectional intensity data (OMN) and ion sectored count data (SEC) were generated. These ASCII text files are publicly available at the *Wind* project web page. In addition, a process has begun to compute the first order ion anisotropy from these observations. The results for the first five events are also available from the *Wind* project web page. This effort will continue and more event files will be made public once the Sun becomes more active again. Also the anisotropy

computations will be completed for all of the events. The current status of the EPACT data sets is summarized in the table below.

Data Product	Time Res.	Time Coverage	Format	Location
KP fluxes	92 sec	1994/11/16-Present	CDF	CDAWeb
OMN omnidirection fluxes	1 hour	41 events	ASCII	Wind Project
SEC sectored counts	1 hour	41 events	ASCII	Wind Project
Anisotropy	1 hour	5 events	ASCII	Wind project

Locations:
CDAWeb: http://cdaweb.gsfc.nasa.gov
Wind Project: http://wind.nasa.gov

MFI

Documentation. The *Wind* Magnetic Field Investigation (MFI) is composed of two fluxgate magnetometers located at the mid point and end of a long boom. The instrument measures DC vector magnetic fields up to a time resolution of 22 or 11 vectors/sec depending on the telemetry mode of the spacecraft. The instrument is completely described in an article by *Lepping et al.* [1995]. The instrument description sections of this paper are reproduced at the *Wind* project web page (http://wind.nasa.gov). Additional information on the instrument can be found at the investigation web page (http://lepmfi.gsfc.nasa.gov).

The data processing algorithms employed in generating the MFI data products are described by *Farrell et al.* [1995]. This paper is also available at the *Wind* Project web page. The largest source of uncertainty in the MFI data is the inherent rms noise due to averaging. The vector rms noise is computed for all data points and for all time averages from the raw telemetered resolution data and is included in the distributed data files.

Data Products. The MFI team essentially generates only one kind of data product, the vector magnetic fields, at various time resolutions and with increasing quality of calibrations. Within 24 hour of measurement, the 92-second KP data is publicly available at CDAWeb. This data uses periodically updated calibration tables. Typically, with no longer than 1 week delay the MFI team produces a calibrated data product that includes 3-second, 1 minute and 1 hour averages. This data product (version 3) has the final calibrations in the spacecraft spin plane. Requiring at least of 6 months of time lag, a final calibrated data, with spin axis corrections typically no more than a few tenth of a nT, are also generated (version 4). This final data has the same format as the version 3 files. To encourage the use of the higher quality data products, CDAWeb keeps only the latest year of KP data on-line. The version 4 files also replace version 3 files at both the CDAWeb and on the instrument web page (http://lepmfi.gsfc.bnasa.gov). All MFI data is backed up in the SPDF active archive and submitted to NSSDC for deep archival.

Till recently, the full 11 or 22 vectors/sec data was too large in volume to serve on-line and has been stored on tapes and made publicly available on request. Currently, there is an ongoing effort to further reduce artificial spin tones in this high time resolution data and package it for web distribution. A new algorithm is already in the testing stage.

The current status of the MFI data products is summarized in the table below.

Data Product	Time Res.	Time Coverage	Format	Location
KP	92 sec	Most recent 1 year	CDF	CDAWeb
Calibrated version 3	3 sec, 1 min, 1 hour	1994/11/16-1 week lag	CDF	CDAWeb, MFI
Definitive version 4	3 sec, 1 min, 1 hour	1994/11/16-~6 months lag	CDF	CDAWeb, MFI
High Res	11 or 22 vec/sec	1994/11/16-Present	ASCII	On request

Locations:
CDAWeb: http://cdaweb.gsfc.nasa.gov
MFI: http://lepmfi.gsfc.nasa.gov

WAVES

Documentation. The *Wind* WAVES experiment composed of the RAD1, RAD2 and TNR receivers measures electric fields in a wide range of frequencies. The instrument is fully documented by *Bougeret et al*. [1995]. The instrument related sections of this paper are reproduced at the *Wind* project web page (http://wind.nasa.gov). Some additional documentation exists also at the WAVES instrument web page (http://www-lep.gsfc.nasa.gov/waves/). The content and format of the various WAVES data products are also described on the instrument web page.

Data Products. As most other *Wind* instruments, WAVES also produces a KP data product that is immediately publicly available at CDAWeb. The WAVES KP data contains 3-minute averages of the electric field intensities at 76 log-spaced frequencies and electron density estimates based on neural network determined electron plasma frequency values. In addition, the team produces, with no more than 1 week delay, higher time resolution (1 minute) normalized receiver voltages and makes it available both at CDAWeb and on their own web site. This is the fundamental data product that is used for the generation of the familiar WAVES frequency vs. time intensity plots. These plots are also pre-generated and publicly available on the instrument web page in PDF format. Finally, 7-10 second time resolution electron density estimates are also computed and made available at CDAWeb.

The WAVES team also maintains a Type II/IV catalog on their web site that is widely used. The current status of the WAVES data products is summarized in the table below.

Software Tools. Unlike the other *Wind* instrument teams, the WAVES team distributes primarily the lowest level data they have without generating many higher level products. Therefore, dedicated software tools are necessary for non-specialists to make us of this data. The team maintains a small IDL software library on their web site that readily ingests the downloaded IDL save files and allows the custom generation of data plots.

Data Product	Time Res.	Time Coverage	Format	Location
KP	3 min	1994/11/10-Present	CDF	CDAWeb
Rad1,Rad2, TNR	1 min	1994/11/10-Present	ASCII, IDL save	CDAWEb, WAVES
High Res Electron Density	7-10 sec	1994/11/10-Present	CDF	CDAWeb
Rad1, Rad2 plots	1 min	1994/11/10-Present	PDF	WAVES

Locations:
CDAWeb: http://cdaweb.gsfc.nasa.gov
WAVES: http://www-lep.gsfc.nasa.gov/waves/

KONUS and TGRS

The KONUS and TGRS γ-ray instruments are not maintained by heliophysics. Their data production and data distribution is completely handled by the astrophysics division. Description of the instruments and links to their data products can be found at (http://heasarc.gsfc.nasa.gov/docs/heasarc/missions/wind.html).

Wind and VHO

Members of the *Wind* instrument teams have taken leadership roles in the development of the Virtual Heliospheric Observatory (VHO) (http://vho.nasa.gov). Aside from assuring that the various data products are publicly open, the most effort goes into the generation of SPASE dictionary based and VHO compliant metadata. In fact, the first *Wind* data product metadata files have been used to refine the SPASE dictionary for fields and particles data. Currently, four *Wind* data products are fully searchable via the VHO: the 3DP PM 3-second proton data, the SWE bi-Maxwellian anisotropic proton and alpha particle data and the version 3 and 4 MFI magnetic field data sets.

It is our plan to include each and every *Wind* data set in the VHO database within the next 2 years. The current effort focuses on adding the rest of the 3DP products and developing the metadata standard for high energy particles that will be needed to include EPACT and SMS data.

Wind Science Center

Under an optimal funding scenario, we are requesting a modest funding increase to develop a *Wind* Science Center at the Berkeley STEREO IMPACT Science Center. As it is evident from the above descriptions, the *Wind* data products are widely distributed in location, format and level of description. The VHO development will solve the location and description issues, but it will not change any of the existing files. Since it is expected that *Wind* will play an increasingly important role in supporting STEREO in-situ science research, it would be prudent to present *Wind* data in format as similar as possible to their STEREO counterparts. Since STEREO IMPACT adopted ISTP CDF as its data standard, this is not an overwhelming task. In fact, most of the relevant *Wind* data products are already in ISTP CDF format. The only task is to provide compatible internal metadata with each data file and coordinate conversion routines to move from GSE to RTN coordinates. Physically co-locating some of the *Wind* data with the STEREO IMPACT database also will enable the ready ingestion of *Wind* data products into STEREO software routines.

In addition, the *Wind* Science Center will make the first steps toward a *Wind* Resident Archive. Clearly, after the termination of the *Wind* mission, the large number of current data operations and web pages cannot be maintained. Starting to consolidate data services to a centralized, independently funded data center appears to be the most cost effective way to prepare *Wind* data for an eventual successful transition to a post active mission life.

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