

Space Physics Data Facility (SPDF) and Our Collaboration with CCMC

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NASA Goddard Space Flight Center, Greenbelt, MD

CCMC Workshop June 10, 2022

The Hotel at University of Maryland, College Park, MD

Introduction to SPDF

spdf.gsfc.nasa.gov



- ❑ SPDF is the **active and final archive of non-solar data** from NASA heliophysics missions and collaborative missions with other US and foreign agencies
 - Facilitate scientific analysis of multi-instrument and multi-mission data sets
 - Enhance the science return of many missions, providing context with other missions
 - Facilitate **open science** and long-term archiving
 - Make data available via many access methods (HTTP, FTP, REST, HAPI)
- ❑ We also archive other data **relevant to NASA heliophysics science objectives**
 - Related data from *planetary missions*, such as MAVEN, New Horizons
 - Heliophysics data from some NOAA and DoD satellites, such as GOES, DSCOVR, LANL
 - Non-US missions such as Arase and Formosat upon request
 - Ground-based magnetometers, aurora cameras, radars, etc., which are funded by NSF or other agencies
- ❑ We work closely with missions (some since their early development) on data issues and planning, particularly in implementing **ISTP data standards**

Over 200 Missions/Projects Supported by SPDF

* Only orbit data available

ACE	Cluster	GOES	Kepler	Parker Solar Probe	Spitzer
Active*	Cosmos 900	GOLD	LANL	Phobos	Sputnik 1
Aeros	C-NOFS	GPS	LRO	Pioneer	STEREO
AIM	CRRES	GMS 3	LUNA	Pioneer 10	Suisei
Akebono*	CSSWE	GRACE*	Magsat	Pioneer 11	Swarm
Alouette1	Dawn*	Granat	MAP	Pioneer Venus	Tatiana
Alouette2	DEMETER*	Hawkeye	Mariner 10	Polar	THEMIS
AMPTE	DMSP	Helios	Mars	Prognoz	TIMED
APEX-MAIN*	Double Star*	Hinode	MAVEN	Reimei	TRACE
Apollo	DSCOVR	Hinotori	MESSENGER	Rosetta*	TWINS
Aqua	DE	IBEX	Microlab 1	RHESSI	UARS*
Ariel-4	Equator-S	ICON	Mir*	SAMPEX	Ulysses
Arase (ERG)	Explorer	IMAGE	MMS	Sakigake*	Van Allen Probes
ARCAD	FAST	IMP 7	MRO	San Marco	Vega
ARTEMIS	FIREBIRD*	IMP 8	MSL	SCATHA*	Venera
ASTRID II*	Formosat	IMP_early	MSX*	SDO	Viking
AE	Freja*	Interball	Munin	SET-1/DSX	Voyager
Aura	Galileo*	ISEE	New Horizons	SMILE	Voyager 1
Aureol2	GCOM W1	ISEE 3-ICE	NOAA*	SNOE	Voyager 2
BARREL	Genesis	ISIS	Oersted	SOHO	Wind
BepiColombo	Geotail	ISS	OGO	Solar Orbiter	XMM-Newton
CALIPSO	Giotto*	Jason 2	Ohzora	SORCE	Yohkoh*
Cassini*	GOCE	Juno	PARASOL	Spartan-A	Zond
Cassiope					

Total: ~3000 data sets, ~40 million data files, ~400 TB data

Recent average **monthly** data ingestion rate: ~0.6 million data files, ~14 TB data

Science-Enabling Services Provided by SPDF

1. Coordinated Data Analysis Web (CDAWeb)

- Primary SPDF data service for mission data
- Present data set view rather than individual data files
- List, plot, subset, and download data in CDF or ASCII format

2. Satellite Situation Center (SSCWeb)

- List and plot the orbits of multiple s/c in a variety of coordinate systems
- Query for satellite-satellite and satellite-ground station conjunction.
- Include most heliospheric satellites and many ground stations.
- **4D Orbit Viewer:** Interactive 4D animation of orbits

3. OMNI Web and COHO Web

- Magnetic field, solar wind plasma, and energetic particle data in various locations of the heliosphere, especially the OMNI data mapped to Earth's bow shock
- Interface for plotting, filtering, and downloading the data

1. Coordinated Data Analysis Web (CDAWeb)

<https://cdaweb.gsfc.nasa.gov/>

~80 Missions/Sources

- Enable multi-mission, multi-instrument science
- Present data set view rather than individual data files
- List, plot, and correlate data
- Download full or a subset of data in CDF or ASCII format

- Select zero OR more Sources
(default = All Sources if ≥ 1 Instrument Type is selected)

- ACE
- AMPTE
- ARTEMIS
- Alouette
- Apollo
- Arase (ERG)
- BepiColumbo
- CNOFS
- CRRES
- Cassini
- Cluster
- DMSP
- DSCOVR
- Dawn
- Dynamics Explorer
- Equator-S
- FAST

...

- Balloons
- Ground-Based Investigations
- Helio ephemeris
- OMNI (Combined 1AU IP Data; Magnetic and Solar Indices)
- Smallsats/Cubesats
- Sounding Rockets

- Select zero OR more Instrument Types
(default = All Instrument Types if ≥ 1 Source is selected)

- Activity Indices
- Electric Fields (space)
- Electron Precipitation Bremsstrahlung
- Energetic Particle Detector
- Engineering
- Ephemeris/Attitude/Ancillary
- Gamma and X-Rays
- Housekeeping
- Imaging and Remote Sensing (ITM/Earth)
- Imaging and Remote Sensing (Magnetosphere/Earth)
- Imaging and Remote Sensing (Sun)
- Magnetic Fields (Balloon)
- Magnetic Fields (space)
- Particles (space)
- Plasma and Solar Wind
- Pressure gauge (space)
- Radio and Plasma Waves (space)
- Radio and Plasma Waves (space), Electric Antennas
- Spacecraft Potential Control
- UV Imaging Spectrograph (Space)
- Ground-Based HF-Radars
- Ground-Based Imagers
- Ground-Based Magnetometers, Riometers, Sounders
- Ground-Based VLF/ELF/ULF, Photometers

CDA Web Service Client Codes for Python and IDL

CDAWeb Data Selector

• To go forward to plot, list and retrieve your selected data, press the "submit" button directly below or at the bottom of this page.

• For any special notes on usage of a given data set, please click on that data set name below.

• As needed to select the datasets of actual interest to you:

- manually check/uncheck one or more data sets from the list below OR
- [Click here to CLEAR All checkboxes](#), OR
- [Click here to SELECT All checkboxes](#)

Submit

- AC_OR_SSC**: ACE GSE Positions @ 12 min resolution - SSC/SSCWeb (NASA's GSFC)
[Available Time Range: 1997/08/25 17:48:00 - 2022/08/01 23:48:00] [Info](#) [Metadata](#)
- AC_OR_DEF**: ACE Daily GSE and J2000 GCI Position Data - E. C. Stone (California Institute of Technology)
[Available Time Range: 1997/08/26 00:00:00 - 2022/06/08 00:00:00] [Info](#) [Metadata](#)
- AC_AT_DEF**: ACE Hourly RTN, GSE and J2000 GCI Attitude direction cosines - E. C. Stone (California Institute of Technology)
[Available Time Range: 1997/08/26 00:00:00 - 2022/06/08 01:00:00] [Info](#) [Metadata](#)
- AC_H2_CRIS**: ACE/CRIS Cosmic Ray Isotope Spectrometer 1-Hour Level 2 Data - E. C. Stone (California Institute of Technology)
[Available Time Range: 1997/08/27 00:00:00 - 2022/05/18 23:00:00] [Info](#) [Metadata](#)

Link to **SPASE** (Space Physics Archive Search and Extract) Record, main description

CDAS Web Service Client Code Examples

The following web service client code examples demonstrates how to access data from the [AC_OR_SSC](#) dataset from particular programming environments.

cdasws Python Library

The following code demonstrates using the cdasws library to access [AC_OR_SSC](#) data in Python. It is merely an example and does not show all the capabilities of the library. You should edit the code to suit your needs.

```
# Install these prerequisites once before executing the example code:
# Option 1.
# Install CDF from https://cdf.gsfc.nasa.gov/
# pip install -U spacepy
# pip install -U cdasws
# Option 2.
# pip install -U xarray
# pip install -U cdflib
# pip install -U cdasws

from cdasws import CdasWs
cdas = CdasWs()

# Edit the following vars, time variables, and printing to suit your
environment
# (spacepy or cdflib) and needs.
vars = ['GSE_LAT', 'GSE_LON', 'RADIUS', 'XYZ_GSE', 'XYZ_GSEO']
time = ['2022-08-01T21:48:00.000Z', '2022-08-01T23:48:00.000Z']
status, data = cdas.get_data('AC_OR_SSC', vars, time[0], time[1])

# If spacepy was installed
print(data['GSE_LAT'])
print(data['GSE_LAT'].attrs)
#print(data)
# ...
# see https://spacepy.github.io/datamodel.html

# If xarray and cdflib was installed
#print(data.data_vars['GSE_LAT'].values)
#print(data.data_vars['GSE_LAT'].attrs)

#print(data)
# ...
```

Copy code to clipboard Download code

More information about using this library is available from the following:

- PyPI description [cdasws](#)
- Jupyter Python [notebook example](#)
- Application Programming Interface description [API](#)

Metadata → Skeleton Table

Global & Variable Attributes

CDAWeb Data Selector

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[- Click here to CLEAR All checkboxes, OR](#)

[- Click here to SELECT All checkboxes](#)

- AC_OR_SSC**: ACE GSE Positions @ 12 min resolution - SSC/SSCWeb (NASA's GSEFC)
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- AC_AT_DEF**: ACE Hourly RTN, GSE and J2000 GCI Attitude direction cosines - E. C. Stone (California Institute of Technology)
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- AC_H2_CRIS**: ACE/CRIS Cosmic Ray Isotope Spectrometer 1-Hour Level 2 Data - E. C. Stone (California Institute of Technology)
[Available Time Range: 1997/08/27 00:00:00 - 2022/05/18 23:00:00] [Info](#) [Metadata](#)

```
! Skeleton table for the "ac_or_ssc_00000000_v01.cdf" CDF.
! Generated: Thursday, 19-May-2022 11:44:16
! CDF created/modified by CDF V3.8.0
! Skeleton table created by CDF V3.8.1_0

#header

                                CDF NAME: ac_or_ssc_00000000_v01.cdf
                                DATA ENCODING: NETWORK
                                MAJORITY: ROW
                                FORMAT: SINGLE

! Variables  G.Attributes  V.Attributes  Records  Dims  Sizes
! -----
!           4/4           28           27           0/z     0
! CDF_COMPRESSION: None
! (Valid compression: None, GZIP.1-9, RLE.0, HUFF.0, AHUFF.0)
! CDF_CHECKSUM: None
! (Valid checksum: None, MD5)
! CDF_LEAPSECONDLASTUPDATED: 20150701

#GLOBALAttributes

! Attribute      Entry      Data      Value
! Name           Number     Type      -----
! -----
"TITLE"         1:         CDF_CHAR  { "SSC ORBIT CDF" } .
"Project"       1:         CDF_CHAR  { "SSC" } .
"Discipline"    1:         CDF_CHAR  { "Space " -
"Physics>Interplanetary " -
"Studies" } .
"Source_name"   1:         CDF_CHAR  { "ACE" } .
"Data_version"  1:         CDF_CHAR  { "1" } .
"ADID_ref"      1:         CDF_CHAR  { "NSSD0110" } .
"Logical_file_id" 1:         CDF_CHAR  { "ac_or_ssc_00000000_v01" } .
"Data_type"     1:         CDF_CHAR  { "OR>Orbit" } .
"Descriptor"    1:         CDF_CHAR  { "SSC>Satellite Situation " -
"Center Ephemeris" } .
"TEXT"          1:         CDF_CHAR  { "GROUP 1  Satellite " -
"Resolution  Factor" }
                2:         CDF_CHAR  { "          ace " -
"720         1" } .
```

CDAWeb Data Explorer

Automatically set as the last available day of the selected datasets

Options:

bin averaging, spike removal, noise filtering, overlay plotting, audification, animation

Select start and stop times from which to GET or PLOT data:

Start time (YYYY/MM/DD HH:MM:SS.mmm):

Stop time (YYYY/MM/DD HH:MM:SS.mmm):

Compute uniformly spaced binned data for scalar/vector/spectrogram data (not available with noise filtering) ^{NEW}

Binning interval:

Method to handle missing values: Use Fill Value Interpolate

Spike removal method:

[More information about binning is available here.](#)

Use spike removal to filter data without binning (not available with noise filtering)(Warning: Experimental !!).

Select an activity:

Plot Data : select one or more variables from list below and press submit.

Also create PS and PDF best quality outputs (all plot types except images and plasmagrams).
Many panels per dataset are allowed but <=4 panels optimal for standard Y-axis height and single page display.

Use coarse noise filtering to remove values outside 3 deviations from mean of all values in the plotted time interval.

Increase the Y-axis height for time-series and spectrogram plots. ^{NEW}
multiply by:

Combine all time-series and spectrogram plots, for all requested datasets, into one plot file.

Plot overlay options. ^{NEW}

Overlay vector components of selected variables.

Overlay selected variables or variable components that are identical among the datasets chosen
(Supported constellations: MMS, Van Allen Probes (RBSP), THEMIS, Cluster, and GOES).

List Data (ASCII/CSV): select one or more variables from list below and press submit. (Works best for < 31 days)

Download original files : press submit button to retrieve list of files. (Max. 200 days - use [HTTPS site](#) for larger requests)

Create V3.8 CDFs for download or Autoplot demonstration: select one or more variables from the list below and press submit.

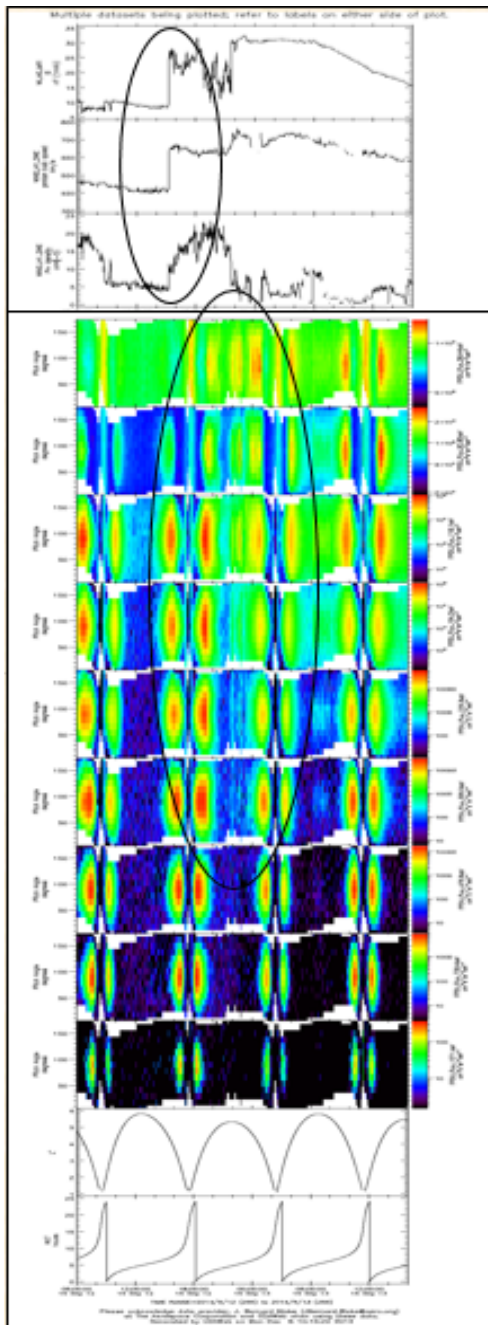
Create audio files based on data from selected variables. ^{NEW}

[More information about audification is available here.](#)

Note: [CDF patch](#) required for reading Version 3.8 CDFs in IDL or MATLAB.
Get [CDFX](#) - IDL GUI plotting/listing toolkit software. To be used with either the daily or "created" CDF files available above.

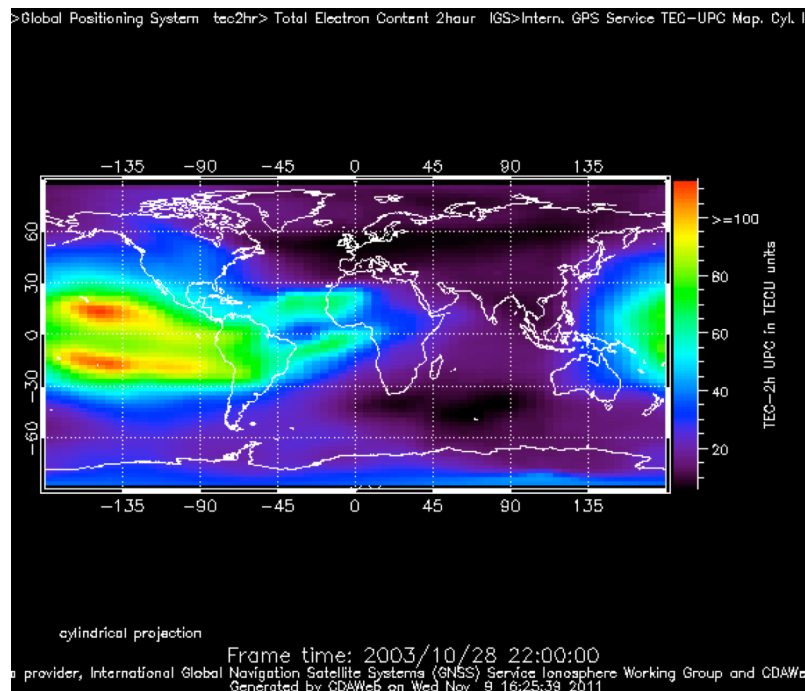
^{NEW} Pressing the "Submit" button will spawn a new window/tab in order to support the new "Previous" and "Next" functions.

WIND MFI & SWE
Van Allen Probe A ECT & MagEIS

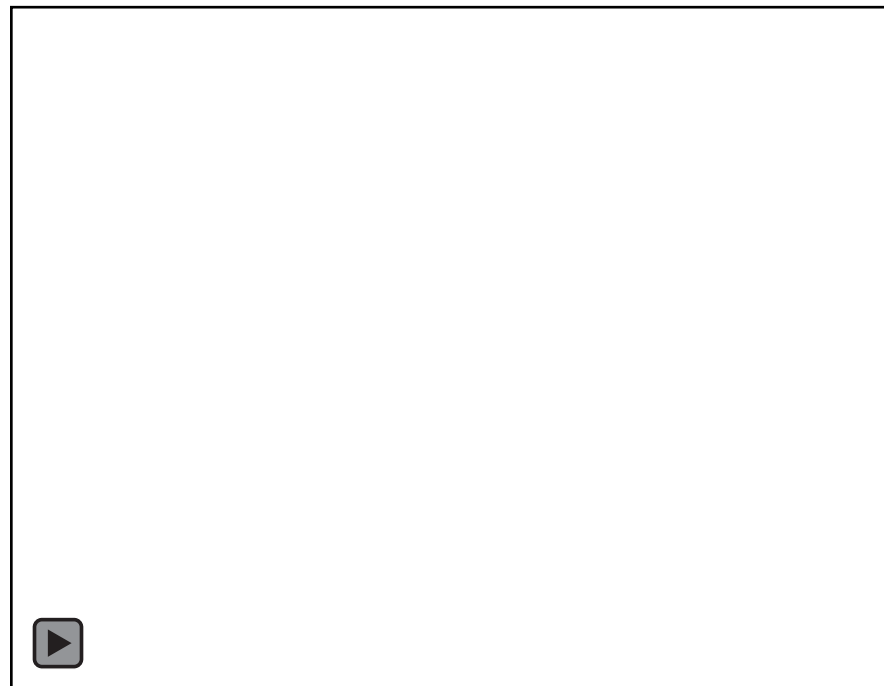


Example Plots from CDAWeb

CDAWeb has the internal capability to apply filters (quality flags) and display data graphically in different ways depending on variable dimensionality



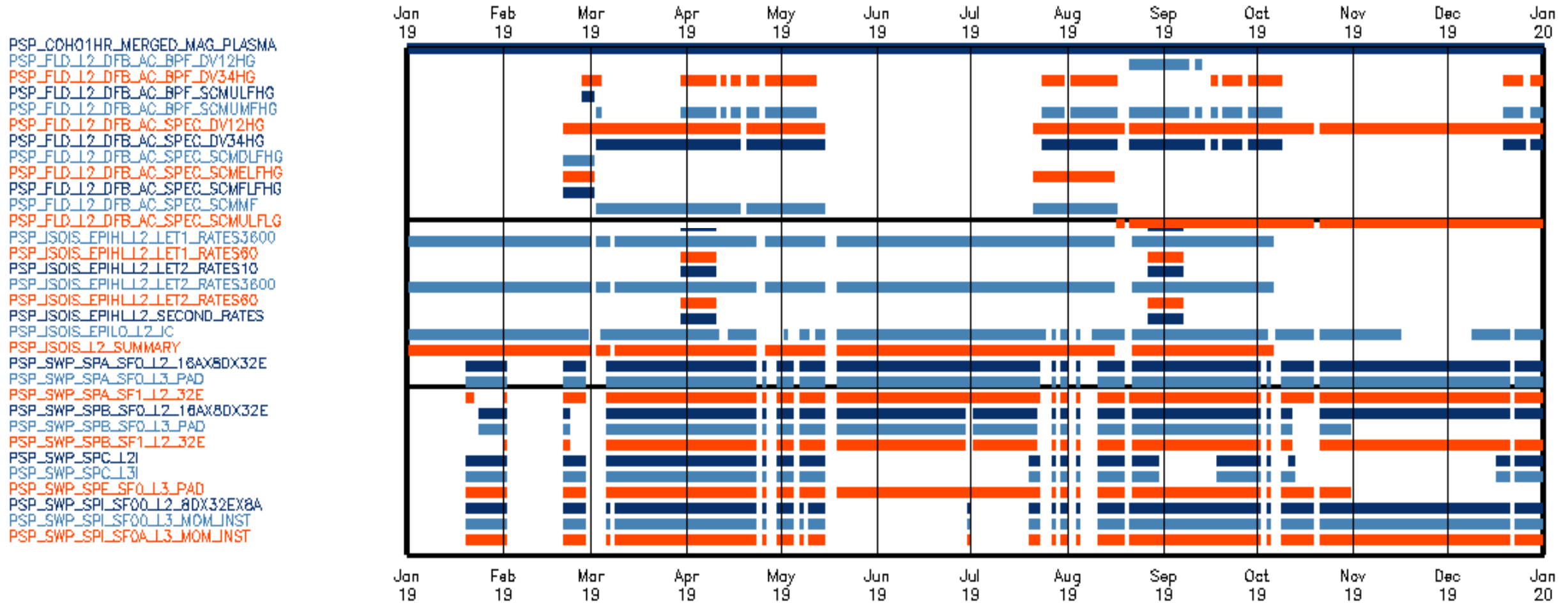
GPS International GNSS Service
Total Electron Content



TIMED/TIDI Wind Vectors Movie
Transverse Mercator Projection

Additional Resources at CDAWeb

Part of the Inventory Plot for Parker Solar Probe (PSP) Data in 2019



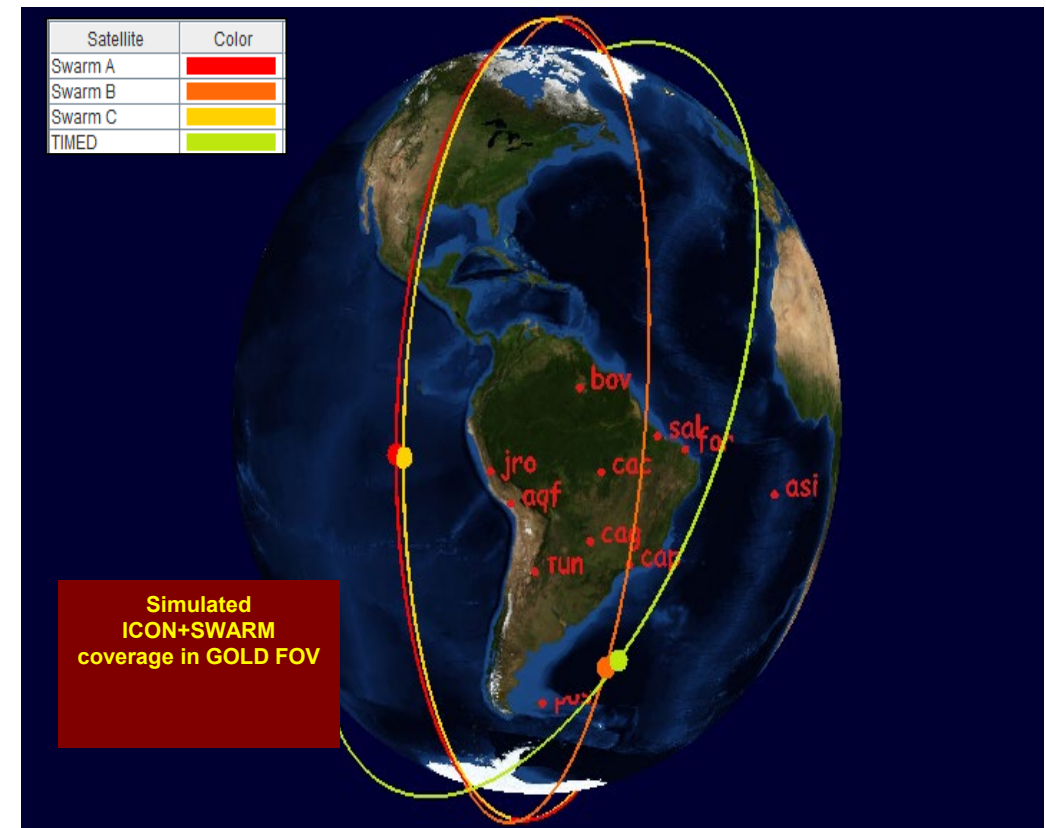
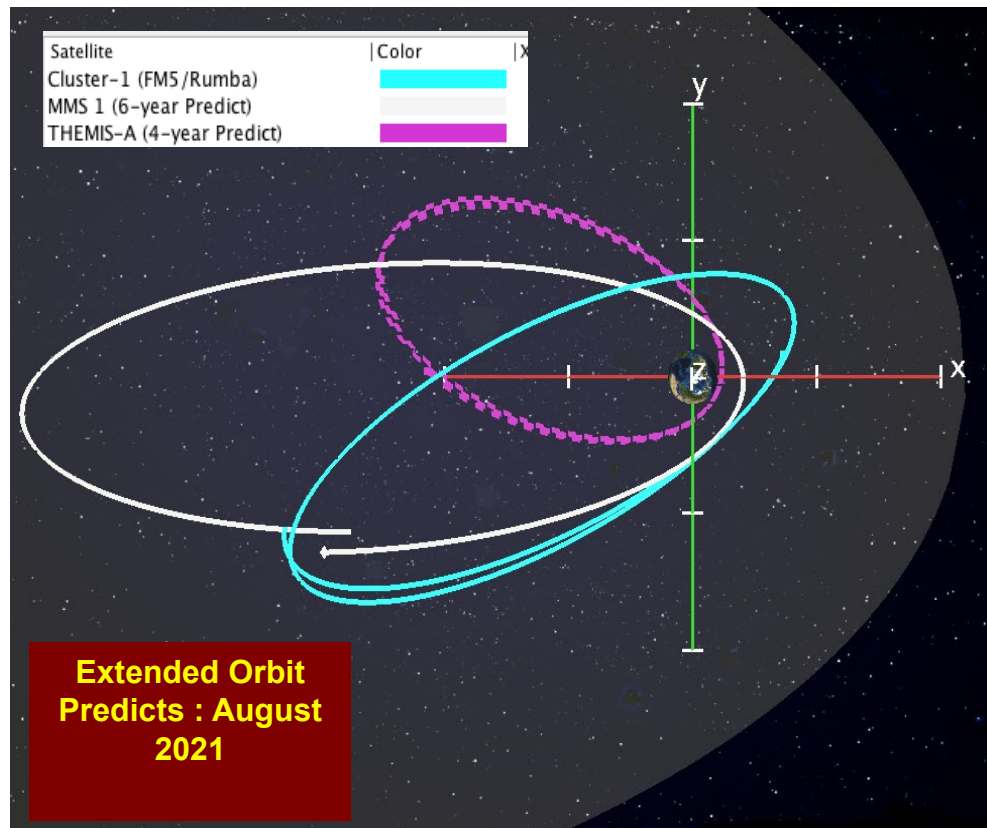
At CDAWeb, the inventory plots are available for every mission and they are updated daily.

There are also usage statistics for all the data sets.

2. Satellite Situation Center (SSCWeb)

Upgrade Is
Coming !

- Include most heliospheric satellites and many ground stations
- List and plot orbits of multiple s/c in a variety of coordinate systems
- **4D Orbit Viewer:** Interactive 4D animation of orbits
- Query for satellite-satellite and satellite-ground station conjunctions



GODDARD SPACE FLIGHT CENTER
Space Physics Data Facility

+ Goddard Home
+ Visit NASA.gov

SEARCH NASA
 + GO

+ HOME + DATA & ORBITS + ModelWeb at CCMC + SCIENCE ENABLED + AND MORE

+ OMNIWeb Plus, Home

- Low res. OMNIWeb Home

+ ABOUT OMNI DATA

+ INPUT DATA

+ NEWS

+ Citing OMNI data usage

+ High res. OMNIWeb Home

+ DATA via FTPBrowser

+ OMNI via SPDF/FTP

OMNIWeb

SPDF • Goddard Space Flight Center

Hourly "Near-Earth" solar wind magnetic field and plasma data, energetic proton fluxes (>1 to >60 MeV), and geomagnetic and solar activity indices.

Browse and Retrieve Data

- Plots, listings, output files
- Scatter plots and linear regression fits
- Event lists or hourly lists/plots, with filtering
- Distribution functions, averag., std. deviation
- IMF polarity (1963-present)
- New derived parameters

About OMNI 2 Data and OMNIWeb

- Overview
- **OMNI 2 Data**
 - Data availability
 - Description of records and words
 - Time shifts
 - Parameter normalizations

Access Data by FTP

- Hourly averages
- Daily averages (omni_01_av.dat)
- 27-day averages(omni_27_av.dat)
- Yearly averages(omni_yearly.dat)
- Plasma,IMF in RTN system(omni_m files)

Access data contributing to OMNI

- S/C Specific data shifted to to Earth
- Wind and ACE cross-normalized plasma data
- Magnetic field: IMP-8, ISEE-3, Wind, ACE
- Plasma: IMP-6,7,8, ISEE-3, Wind, ACE
- Energetic particle fluxes
- Geomagnetic and solar indices

If you have any questions/comments about OMNI/OMNIWEB data and service, contact: [Dr. Natalia Papitashvili](#), Space Physics Data Facility, Mail Code 672, NASA/Goddard Space Flight Center, Greenbelt, MD 20771

3. OMNI Web

- Database of plasma and magnetic field from **selected or combined** L1 s/c mapped to the nose of the Earth's bow shock
- Based on a large volume of quality-controlled satellite measurements (since Nov. 1963)
- OMNI: 1-min, 5-min
- OMNI 2: hourly, daily, 27-day, yearly
- Some statistical functions: scatter plots, linear regression, etc.

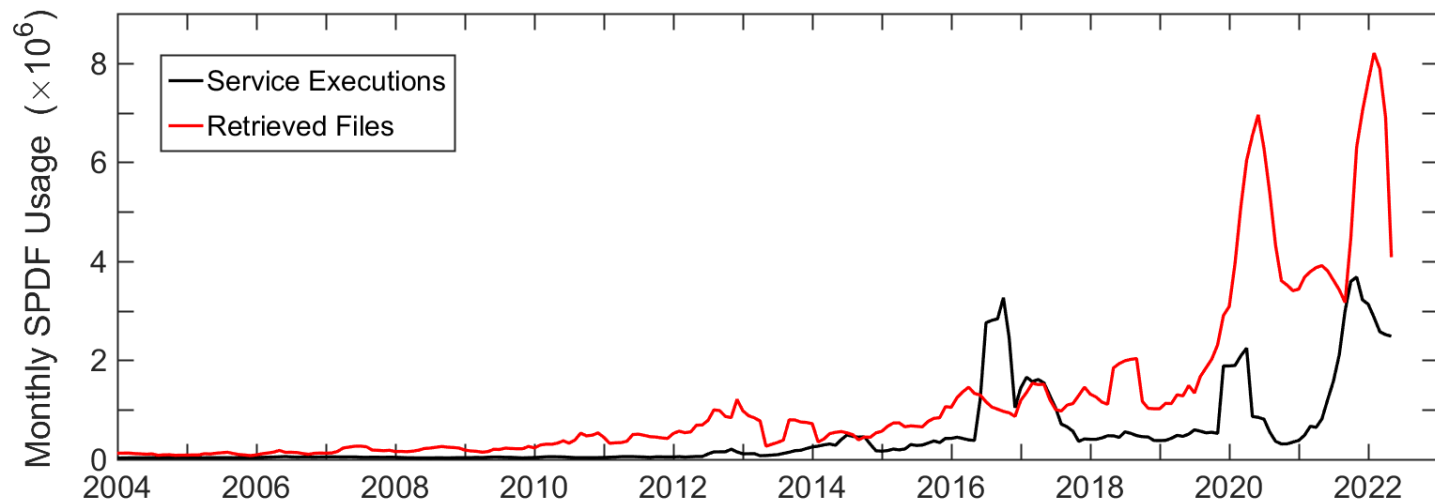
COHO Web (<https://omniweb.gsfc.nasa.gov/coho/>)

PATHWAYS BY FUNCTIONALITY

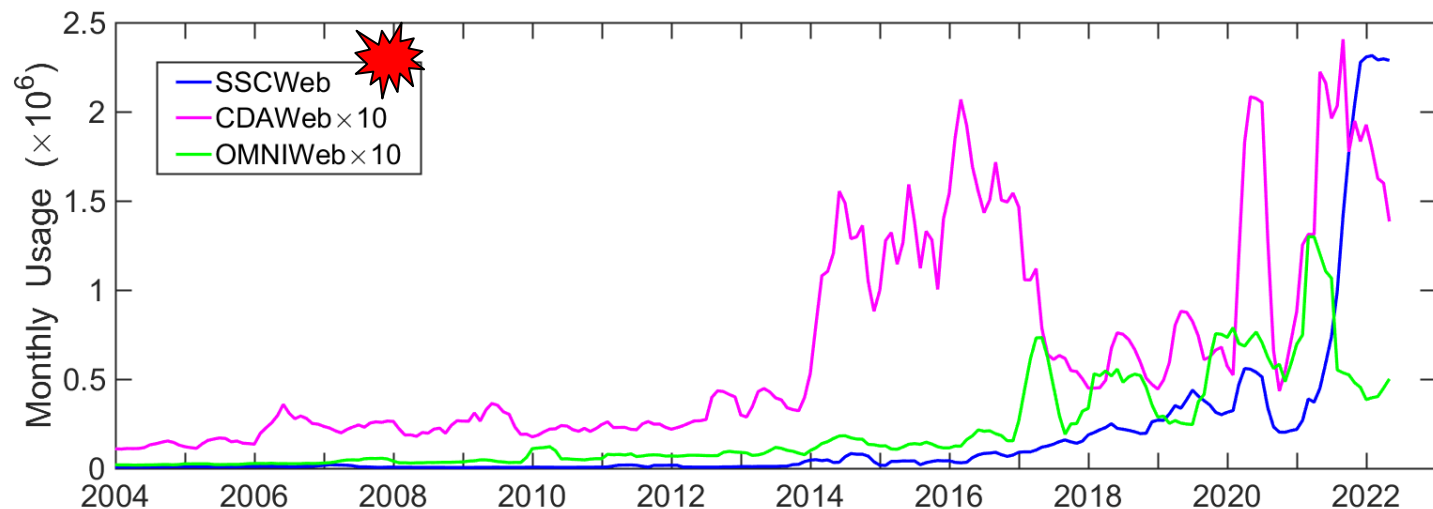
Spacecraft <small>* H fluxes included</small>	Graphical browse and listing	Listing, Plot with filtering	Distribution functions, medians, avgs, std devs	Scatter plot, linear regr. fits	FTP access to hourly data	FTP access to high res. data
*Helios1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
*Helios2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
New Horizons	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
*OMNI_M	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Parker Solar Probe (PSP)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
*Pioneer10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
*Pioneer11	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Pioneer Venus	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Solar Orbiter (SOLO)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
*Stereo-A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
*Stereo-B	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
*Ulysses	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
*Voyager1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
*Voyager2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Mariner2	<input checked="" type="checkbox"/>					
Pioneer6	<input checked="" type="checkbox"/>					
Pioneer7	<input checked="" type="checkbox"/>					

- **Hourly and daily** merged plasma, magnetic field, proton fluxes and ephemerides data at various locations of the heliosphere
- **Useful to provide model input and to validate models**
- *We can (urge the mission teams to) develop median-cadence data (e.g., 10-min for interplanetary space) of these parameters if needed*
- Contact: Natalia Papitashvili

Extensive Use of SPDF Data & Services



- Significant increase of [SSCWeb](#) usage since 2021 is probably related to CCMC and other users for model-observation comparison



- In 2021, ~40% of papers in AGU's *JGR Space Physics* and *Space Weather* journals acknowledged SPDF services and/or data

Heliophysics Data Portal (HDP)

<https://heliophysicsdata.gsfc.nasa.gov/>

Heliophysics Data Portal "Find it. Browse it. Get it." SPASE inside

Help Geo Orbits Helio Orbits SPASE Registry ADS Abstracts Feedback

Text Restriction
[Input field] Add

Time Span Restriction ⓘ
YYYY-MM-dd or YYYY-DDD
from: [Input field]
to: [Input field] Add

Element Restriction ⓘ
Resource type ⓘ
Measurement type ⓘ
Observatory_Group ⓘ
Observatory ⓘ
Instrument ⓘ
Observed region ⓘ
Spectral range ⓘ
Cadence ⓘ
Repository Name ⓘ
Access rights ⓘ
Format ⓘ

Current Product Restrictions Remove All
Metadata contains 'CCMC' Remove

Showing 1 - 17 of 17 Results Sort by Observatory

#	Products (& SPASE descriptions)	Access Links
1	AE-8 and AP-8 trapped particle models	• Access to files at the Community Coordinated Modeling Center • About the AE-8 and AP-8 models
2	CCMC Modelweb page	• CCMC Modelweb page
3	CCMC: Heliospheric Model Results	• CCMC heliospheric models results page • CCMC top page
4	CCMC: Heliospheric Models	• CCMC executable heliospheric models page • CCMC top page
5	CCMC: Ionosphere/Atmosphere Model Results	• CCMC ionosphere/atmosphere models results page • CCMC top page
6	CCMC: Ionosphere/Atmosphere Models	• CCMC executable ionosphere models page • CCMC top page
7	CCMC: Magnetospheric Model Results	• Global magnetosphere model results at CCMC • Inner magnetosphere model results at CCMC • CCMC top page
8	CCMC: Magnetospheric Models	• CCMC executable magnetospheric models page • CCMC top page
9	CCMC: Solar Model Results	• CCMC solar models results page • CCMC top page
10	CCMC: Solar Models	• CCMC executable solar models page • CCMC top page

~3000 products

- Products available at HDP
 - remote-sensing data
 - in-situ data
 - some CCMC models (17)
 - Catalogs (17)
- Data authorities are defined in **SPASE** to track data provenance
- SPASE metadata is used by **HDP**, and enables the search by data services
- **DOIs** have been minted through *datacite.org* for ~360 data products for easy citation and tracking

Examples of SPASE Records

HPDE.io

Data Access

- [FTPS access to CDFs at SPDF \(not with most browsers\)](#)
- [HTTP access to CDFs at SPDF](#)
- [CDAWeb](#)
- [FTPS from SPDF \(not with most browsers\)](#)
- [HTTPS from SPDF](#)
- [OMNIWeb, High Resolution OMNI](#)
- [HAPI: CDAWeb HAPI Server](#)

OMNI 1-min Data Set

Papitashvili, N. E., & King, J. H. (2020). OMNI 1-min Data Set [Data set]. NASA Space Physics Data Facility. <https://doi.org/10.48322/45bb-8792>. Accessed on 2022-June-10.

ResourceID

spase://NASA/NumericalData/OMNI/HighResolutionObservations/Version1/PT1M

Description

High resolution data as shifted indices.

Parameter #15

Name

Magnetic field vector, GSE

Description

Averaged GSE Cartesian components of magnetic field vector

Cadence

PT1M

Units

nT

CoordinateSystem

CoordinateRepresentation

Cartesian

CoordinateSystemName

GSE

Structure

Size

3

Description

Three 1-minute averaged magnetic field Cartesian components, in GSE

Element

Name

Bx, GSE

Qualifier

Component.I

Index

1

ParameterKey

Column 15

Element

Name

By, GSE

Qualifier

Component.J

Details

NumericalData

ResourceID

spase://NASA/NumericalData/OMNI/Hic

ResourceHeader

ResourceName

OMNI 1-min Data Set

DOI

<https://doi.org/10.48322/45bb-87>

ReleaseDate

2022-03-09 12:34:56.789

RevisionHistory

RevisionEvent

ReleaseDate

2021-05-31 12:34:56.7

Note

Updated to SPASE Vers

CCMC: Heliospheric Models

ResourceID

spase://SMWG/Service/CCMC/Heliospheric.Models

Description

Run heliospheric models (Heliospheric Tomography of Jackson/Hick, Exospheric Solar Wind Model of Lamy/Pierrard 'soon') at CCMC

[View XML](#) | [View JSON](#) | [Edit](#)

Details

Version:2.3.0

Service

ResourceID

spase://SMWG/Service/CCMC/Heliospheric.Models

ResourceHeader

ResourceName

CCMC: Heliospheric Models

ReleaseDate

2019-04-19 12:34:56.789Z

Description

Run heliospheric models (Heliospheric Tomography of Jackson/Hick, Exospheric Solar Wind Model of Lamy/Pierrard 'soon') at CCMC

Contacts

Role	Person
1. GeneralContact	spase://SMWG/Person/Masha.Kuznetsova
2. GeneralContact	spase://SMWG/Person/Bernard.V.Jackson

InformationURL

Name

CCMC top page

URL

<https://ccmc.gsfc.nasa.gov/>

PriorIDs

spase://VSPO/Service/P_CCMC_HDR_HELIOSPH_RUN
spase://VSPO/Service/CCMC/Heliospheric.Models

AccessURL

Name

CCMC executable heliospheric models page

URL

https://ccmc.gsfc.nasa.gov/models/models_at_glance.php

Summary

➤ As a critical element of HDRL, SPDF archives and serves non-solar data relevant to NASA heliophysics science objectives

- Providing multi-project, cross-disciplinary access to data in order to promote correlative and collaborative research across discipline and mission boundaries
- Maintaining the CDF self-describing science data format and associated software
- Providing three main science-enabling services: CDAWeb, SSCWeb, and OMNIWeb
- Tracking the usage of archived data and assisting mission data management

➤ **Collaboration with CCMC**

- Archiving and service of mission data based on observations and model simulations, e.g., ICON Level 4 TIEGCM data
- Archiving and service of data products from NASA Research & Analysis programs
- Developing observational data products tailored for model input and model validation
- Upgrading SPDF webpages with new *content management system* by learning from CCMC's experience
- Developing the service for event lists which can be useful for CCMC model request and validation