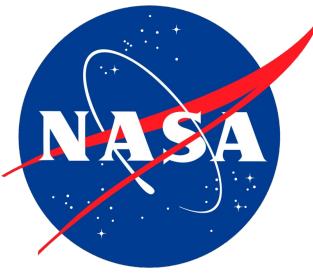


Searching for (non-Solar) Data in Heliophysics

Eric Grimes

NASA GSFC/ADNET Systems

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



Searching for Data

- See:
 - <https://heliophysicsdata.gsfc.nasa.gov>
- This contains a large number of datasets; in addition to the “Text Restriction” input box, you’ll probably want to use the “Element Restriction” section to limit the output
- This page contains dataset names, and where to find the data

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Space Physics Data Facility

HelioPhysics Data Portal “Find it. Browse it. Get it.”

SPASE inside

Help Geo Orbits Helio Orbits SPASE Registry ADS Abstracts Feedback

Text Restriction
[] Add

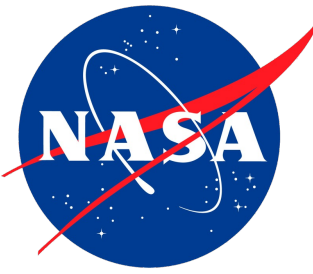
Time Span Restriction
YYYY-MM-dd or YYYY-DDD
from: []
to: [] Add

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

Current Product Restrictions
No restrictions are currently set.

Showing 1 - 20 of 3172 Results View Current List Sort by Observatory

#	Products (& SPASE descriptions)	Information and Access Links
1	3DView Website	<ul style="list-style-type: none">• http://3dview.cdpp.eu/• 3DView home page
2	ABOVE Level-2 Amplitude and Phase VLF Transmitter	<ul style="list-style-type: none">• Canada ABOVE• Athabasca• BarrierLake• Camrose• FortMcMurray• FortSmith• Gillam• IslandLake• LuckyLake• Pinawa
3	ABOVE VLF Level-1 time series uncalibrated CDF	<ul style="list-style-type: none">• Canada ABOVE• Athabasca• BarrierLake• Camrose• FortMcMurray• FortSmith• Gillam• IslandLake• LuckyLake• Pinawa
4	ACE 27-day Survey Plots	<ul style="list-style-type: none">• Polar-Wind-Geotail 'gif-walk' site Get Images/Plots
5	ACE Cosmic Ray Isotope Spectrometer (CRIS) 1-Hour Level 2 Data https://doi.org/10.48322/g/2f	<ul style="list-style-type: none">• FTPS from SPDF (not with most browsers)• HTTPS from SPDF• CDAWeb• CDAWeb HAPI Server• ACE Science Center FTP area• ACE Science Center• ACE Cosmic Ray Isotope Spectrometer (CRIS) Level 2 data Home Page Get Data/Plots
6	ACE Cosmic Ray Isotope Spectrometer (CRIS) Daily Level 2 Data https://doi.org/10.48322/wbmv-4z80	<ul style="list-style-type: none">• FTPS from SPDF (not with most browsers)• HTTPS from SPDF• CDAWeb• CDAWeb HAPI Server• ACE Science Center ftp area• ACE Science Center• ACE Cosmic Ray Isotope Spectrometer (CRIS) Level 2 Data Home Page Get Data/Plots



Searching for Data

- For example, if you set the “Observatory” to “DSCOVR” and the “Measurement type” to “Magnetic Field”, you’ll find all of the B-field datasets for the DSCOVR mission
- Click on the product name to go to the SPASE description
- Note: include quotes in the text restriction text box for exact matches to the full string

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Help | Geo Orbits | Helio Orbits | SPASE Registry | ADS Abstracts | Feedback

Text Restriction: Add

Time Span Restriction: YYYY-MM-dd or YYYY-DDD
from: to: Add

Element Restriction: Resource type, Measurement type, Observatory Group, Observatory, Instrument, Observed region, Spectral range, Cadence, Repository Name, Access rights, Format

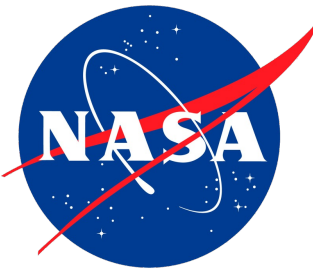
Current Product Restrictions: Observatory equals 'DSCOVR', Measurement type contains 'Magnetic Field'

Showing 1 - 5 of 5 Results | Sort by: Observatory

#	Products (& SPASE descriptions)	Information and Access Links
1	DSCOVR Fluxgate Magnetometer (MAG) Definitive Magnetic Field, 1 second data	• FTPS from SPDF (not with most browsers) • HTTPS from SPDF • CDAWeb • CDAWeb HAPI Server • Deep Space Climate Observatory, DSCOVR, Web Page, NESDIS, NOAA Get Data/Plots
2	DSCOVR Fluxgate Magnetometer (MAG) Level 0 full resolution data	• https://www.ngdc.noaa.gov/dscovr/portal/index.html
3	DSCOVR Fluxgate Magnetometer (MAG) Level 1	• https://www.ngdc.noaa.gov/dscovr/portal/index.html
4	DSCOVR Fluxgate Magnetometer (MAG) Level 2 One Minute Averages	• https://www.ngdc.noaa.gov/dscovr/portal/index.html
5	DSCOVR Fluxgate Magnetometer (MAG) Level 2 One Second Averages	• https://www.ngdc.noaa.gov/dscovr/portal/index.html

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Curator: Tami Kovalick
Last Modified: 23 May 2024

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Searching for Data

HPDE.io

Data Access

- [FTPS from SPDF \(not with most browsers\)](#)
- [HTTPS from SPDF](#)
- [CDAWeb](#)
- [HAPI: CDAWeb HAPI Server](#)

DSCOVR Fluxgate Magnetometer (MAG) Definitive Magnetic Field, 1 second data

ResourceID
spase://NOAA/NumericalData/DSCOVR/PlasMag/FluxgateMagnetometer/CDF/PT1S

Description
DSCOVR Fluxgate Magnetometer (MAG) Definitive Magnetic Field, 1 s Data

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

Details

Version:2.3.0

NumericalData

ResourceID
spase://NOAA/NumericalData/DSCOVR/PlasMag/FluxgateMagnetometer/CDF/PT1S

ResourceHeader

ResourceName
DSCOVR Fluxgate Magnetometer (MAG) Definitive Magnetic Field, 1 second data

ReleaseDate
2021-04-27 17:52:57Z

Description
DSCOVR Fluxgate Magnetometer (MAG) Definitive Magnetic Field, 1 s Data

Acknowledgement
A. Koval

Contacts

	<i>Role</i>	<i>Person</i>	<i>StartDate</i>	<i>StopDate</i>	<i>Note</i>
1.	PrincipalInvestigator	spase://SMWG/Person/Andriy.Koval			
2.	MetadataContact	spase://SMWG/Person/Robert.E.McGuire			
3.	MetadataContact	spase://SMWG/Person/Lee.Frost.Bargatze			

InformationURL

Name
Deep Space Climate Observatory, DSCOVR, Web Page, NESDIS, NOAA

URL
<https://www.nesdis.noaa.gov/content/dscovr-deep-space-climate-observatory>

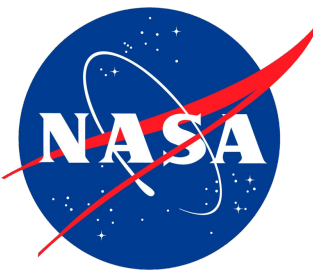
Description
Deep Space Climate Observatory, DSCOVR, Web Page hosted by the National Environmental Satellite, Data, and Information Service, NESDIS, National Oceanic and Atmospheric Administration, NOAA

PriorIDs
spase://VSPO/NumericalData/DSCOVR/PlasMag/FluxgateMagnetometer/PT1S
spase://NOAA/NumericalData/DSCOVR/PlasMag/FluxgateMagnetometer/PT1S

AccessInformation

RepositoryID
<spase://SMWG/Repository/NASA/GSFC/SPDF>

Availability



Searching for Data (from Python)

- There's a library for searching the HDP web services for datasets at:

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

```
HdpWsExample.ipynb
File Edit View Run Kernel Tabs Settings Help
Python 3 (ipykernel)

Get Catalog

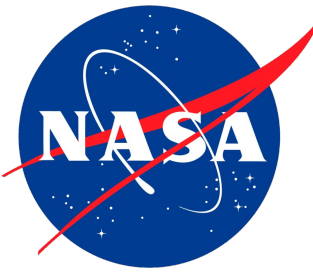
The following code demonstrates how to get a SPASE Catalog document matching the specified criteria.

[10]: query = {
# 'InstrumentID': 'spase://SMWG/Instrument/ACE/MAG',
# 'PhenomenonType': 'MagneticCloud',
# 'Description': 'ICME'
'Keyword': 'current sheet'
}
#time_range = ['1999-01-01', '1999-01-02']
time_range = ['2005-01-01', '2014-01-01']
result = hdp.get_spase_catalog(query, time_range)
if result['HttpStatus'] == 200:
print('Result Catalogs:')
for catalog in result['Result'].findall('./Catalog',
namespaces=NS):
print('ResourceID: ', catalog.findall('./ResourceID',
namespaces=NS)[0].text)
print('ResourceName: ', catalog.findall('./ResourceName',
namespaces=NS)[0].text)
print('Description:',
catalog.findall('./Description',
namespaces=NS)[0].text[:750],
'...')
```

Result Catalogs:
ResourceID: [spase://NASA/Catalog/Eriksson/WindCurrentSheetExhaustList](https://nasa.gov/catalog/Eriksson/WindCurrentSheetExhaustList)
ResourceName: Wind Current Sheet Exhaust Event List in LMN Coordinates
Description: The dataset contains a list of solar wind current sheet exhaust event data derived from Wind interplanetary magnetic field and solar wind plasma observations. The list is described in a peer reviewed article, Eriksson et al. 2022, titled: Characteristics of Multi-Scale Current Sheets in the Solar Wind at 1 AU Associated with Magnetic Reconnection and the Case for a Heliospheric Current Sheet Avalanche. The data is listed as an ASCII table with eleven columns including the current sheet (CS) start date/time and stop date/time, and the three unit vectors of each CS in a GSE base coordinate system. Here, NGSE is the CS normal direction, LGSE is the direction of the reconnecting component of the magnetic field, and MGSE is the cross-product MGS ...

Get Collection

The following code demonstrates how to get a SPASE Collection document matching the specified criteria.



Accessing the Data

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

- Balloons
- Geosynchronous Investigations
- Ground-Based Investigations
- Helio Ephemeris
- OMNI (Combined 1AU IP Data; Magnetic and Solar Indices)
- Smallsats/Cubesats
- Sounding Rockets
- ACE
- AIM
- AMPTE
- ARTEMIS
- Alouette
- Apollo
- Arase (ERG)
- CNOFS
- CRRES
- Cassini
- Cluster
- DMSP
- DSCOVR
- Dynamics Explorer
- Equator-S
- FAST
- Formosat
- GOES
- GOLD
- GPS
- Genesis
- Geotail

- **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
- Ground-Based HF-Radars
- Ground-Based Imagers
- Ground-Based Magnetometers, Riometers, Sounders
- Ground-Based VLF/ELF/ULF, Photometers
- 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)
- Spacecraft Potential Control
- UV Imaging Spectrograph (Space)

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SPASE
inside

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Geo Orbits
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SPASE Registry
ADS Abstracts
Feedback

Text Restriction

Add

Time Span Restriction i

YYYY-MM-dd or YYYY-DDD

from:

to:

Add

Element Restriction i

Resource type i

Measurement type i

Observatory Group i

Observatory i

Instrument i

Observed region i

Spectral range i

Cadence i

Repository Name i

Access rights i

Format i

Current Product Restrictions Remove All

Observatory equals 'DSCOVR' Remove

Measurement type contains 'Magnetic Field' Remove

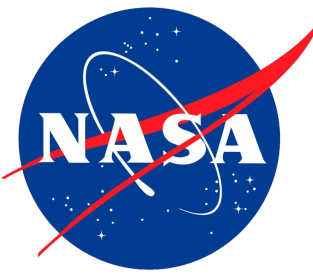
Showing 1 - 5 of 5 Results Sort by Observatory v

# Products (& SPASE descriptions)	Information and Access Links
1 DSCOVR Fluxgate Magnetometer (MAG) Definitive Magnetic Field, 1 second data	<ul style="list-style-type: none"> • FTPS from SPDF (not with most browsers) • HTTPS from SPDF • CDASWeb • CDASWeb HAPI Server • Deep Space Climate Observatory, DSCOVR, Web Page, NESDIS, NOAA
2 DSCOVR Fluxgate Magnetometer (MAG) Level 0 full resolution data	<ul style="list-style-type: none"> • https://www.ngdc.noaa.gov/dscover/portal/index.html
3 DSCOVR Fluxgate Magnetometer (MAG) Level 1	<ul style="list-style-type: none"> • https://www.ngdc.noaa.gov/dscover/portal/index.html
4 DSCOVR Fluxgate Magnetometer (MAG) Level 2 One Minute Averages	<ul style="list-style-type: none"> • https://www.ngdc.noaa.gov/dscover/portal/index.html
5 DSCOVR Fluxgate Magnetometer (MAG) Level 2 One Second Averages	<ul style="list-style-type: none"> • https://www.ngdc.noaa.gov/dscover/portal/index.html

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Last Modified: 23 May 2024

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Accessing the Data

- Select the dataset to create browse plots

OR

- **Click “Info” for info on the dataset, as well as an example of how to access the data from Python**

CDWeb Data Selector

• SELECT AT LEAST ONE DATA SET below before pressing the "Submit" button to continue.

[SELECT ALL checkboxes](#)

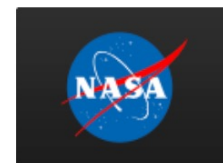
[CLEAR ALL checkboxes](#)

Submit

- DSCOVR_H0_MAG:** DSCOVR Fluxgate Magnetometer 1-sec Definitive Data - A. Koval (UMBC, NASA/GSFC)
[Available Time Range: 2015/06/08 00:00:00 - 2024/04/28 23:59:59] [Info](#) [Metadata](#)

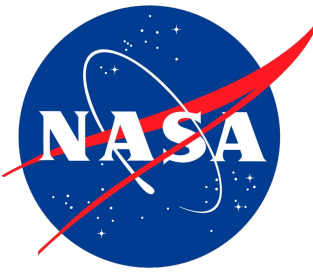
Submit

Reset



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+ Accessibility



Accessing the Data

- Clicking “Data Access Code Examples” takes you to a Python example

DSCOVR_H0_MAG (spase://NOAA/NumericalData/DSCOVR/PlasMag/FluxgateMagnetometer/CDF/PT1S)

Description

DSCOVR Fluxgate Magnetometer 1-sec Definitive Data

Modification History

12/01/2016 Initial release

Data Variable Descriptions

Magnetic field magnitude (1 sec) [B1F1]

Average of the magnitude (F1)

Standard deviation of B magnitude (1 sec) [B1SDF1]

Standard deviation of the magnitude (F1 SIGMA)

Magnetic field vector in GSE cartesian coordinates (1 sec) [B1GSE]

Standard deviation of B vector in GSE coordinates (1 sec) [B1SDGSE]

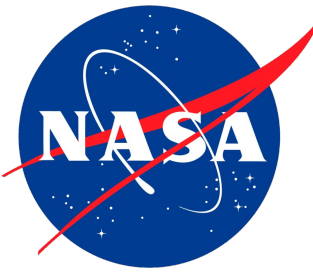
Magnetic field vector in RTN cartesian coordinates (1 sec) [B1RTN]

Standard deviation of B vector in RTN coordinates (1 sec) [B1SDRTN]

[Dataset in CDAWeb](#)

 [python™ / IDL Data Access Code Examples](#)

[Back to top](#)



Accessing the Data

- Click “Launch Binder” to open a Jupyter notebook showing how to access these data



CDAS Web Service Client Code Examples

The following web service client code examples demonstrates how to access data from the [DSCOVER_H0_MAG](#) dataset from particular programming environments.

Jupyter Notebook on Binder

The following link launches a Python Jupyter Notebook that demonstrates using the `cdasws` library to access [DSCOVER_H0_MAG](#) data in a Jupyter Notebook. It is merely an example and does not show all the capabilities of the library. You should edit the code to suit your needs.



`cdasws` `python` Library

The following code demonstrates using the `cdasws` library to access [DSCOVER_H0_MAG](#) 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.

OR

- Copy+paste the script into your terminal



```
# Install these prerequisites once before executing the example code:
# Option 1.
# 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()

dataset = 'DSCOVER_H0_MAG'
# Edit the following var_names and example_interval
# variables to suit your needs.
var_names = cdas.get_variable_names(dataset)
print('Variable names:', var_names)
example_interval = cdas.get_example_time_interval(dataset)
print('Example time interval:', example_interval)
status, data = cdas.get_data(dataset, var_names, example_interval)

if 'spacepy' in str(type(data)):
    # see https://spacepy.github.io/datamodel.html
    print(var_names[0], '=', data[var_names[0]])
    print(data[var_names[0]].attrs)
else:
    # see https://github.com/MAVENSDC/cdflib
    print(var_names[0], '=', data.data_vars[var_names[0]].values)
    print(data.data_vars[var_names[0]].attrs)

print(data)
# ...
```

[Copy code to clipboard](#) [Download code](#)

