

ESA highlights related to IHDEA

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**Plenary IHDEA meeting
19 October 2020**

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1. Solar Orbiter archive now public!
2. Cluster data on SPEDAS, no credentials on RestAPI, HAPI
3. BepiColombo/JUICE SOC request -> SPASE data model 2.3.2
4. DOI related to experiments on ESA heliophysics spacecraft
5. ESDC within VSO: start with Proba-2 then Solar Orbiter, eventually SOHO


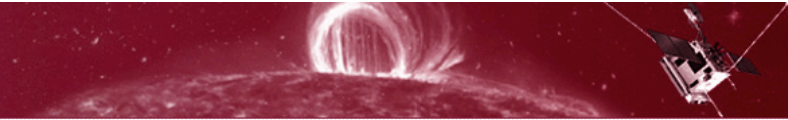
1. Solar Orbiter ARchive (SOAR): now public!

<http://soar.esac.esa.int>



Solar Orbiter Archive


SOAR 1.2




WELCOME TO THE SOLAR ORBITER ARCHIVE

Solar Orbiter is a joint ESA-NASA collaboration that will address the central question of heliophysics: How does the Sun create and control the heliosphere? This primary, overarching scientific objective can be broken down into four interrelated scientific questions:

- How and where do the solar wind plasma and magnetic field originate in the corona?
- How do solar transients drive heliospheric variability.
- How do solar eruptions produce energetic particle radiation that fills the heliosphere.
- How does the solar dynamo work and drive connections between the Sun and the heliosphere.




TOP FEATURES




SEARCH

Search through all SOAR data.




TIME SERIES

Display data in time series.




PROGRAMMATIC ACCESS

Access our content via HTTP requests. Normally used in scripts, application code or command line tools.




ADDITIONAL SCIENCE DATA INFORMATION

Further information and documentation on the Science data production provided by the Instrument Teams. Use the links in these pages to better understand the Science data in the archive.



HELP


Comprehensive guide to all aspects of using the Solar Orbiter Archive.



CONTACT

For questions, suggestions or problem reports, contact our Helpdesk.

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1. Solar Orbiter ARchive (SOAR): now public !

<http://soar.esac.esa.int>



- Solar Orbiter science data now public 3 months after measurements
- SAMP compatible
- Accessible through HelioPy already
- Will be accessible through other services like EPN-TAP and other python libraries

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ESA highlights | A. Masson | IHDEA meeting 19-22 October 2020 | Slide 4/12

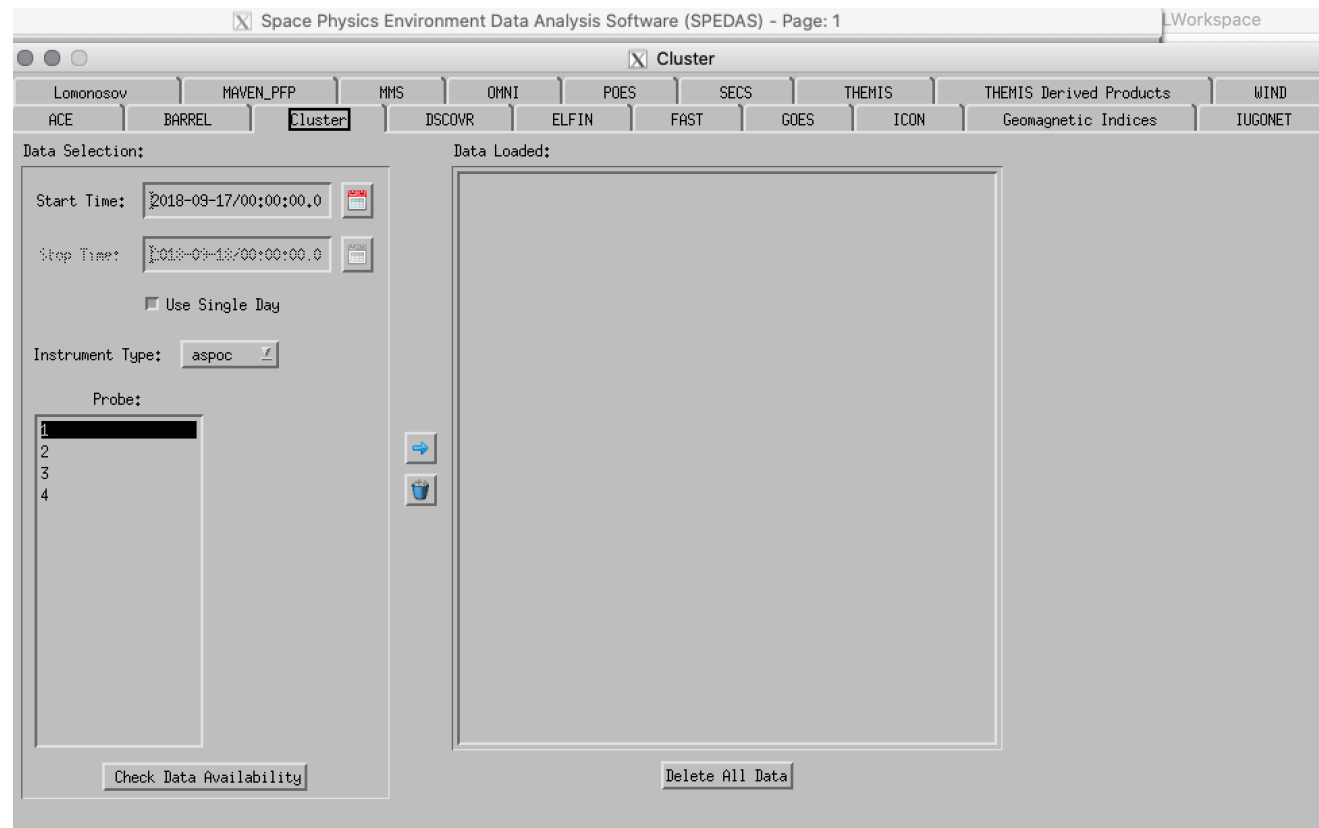


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2. Cluster Science Archive (CSA)



- Cluster data now accessible in SPEDAS. Important for multi-mission studies. Thanks to Jim Lewis et al.
- No credentials now needed to access Cluster data through CSA rest API.
- HAPI implementation: discussions on-going with J. Vandegriff/J. Faden



3. BepiColombo/JUICE request → SPASE 2.3.2



- PDS4 product requires SPASE ID
- What about TM and HK products? sensor Temp.
- Now with SPASE 2.3.2 those can be distinguished from Science products as support quantity
- PDS3 and PDS4 "formats" added
- Mission Manager (ESA) role added

Version: 2.3.2

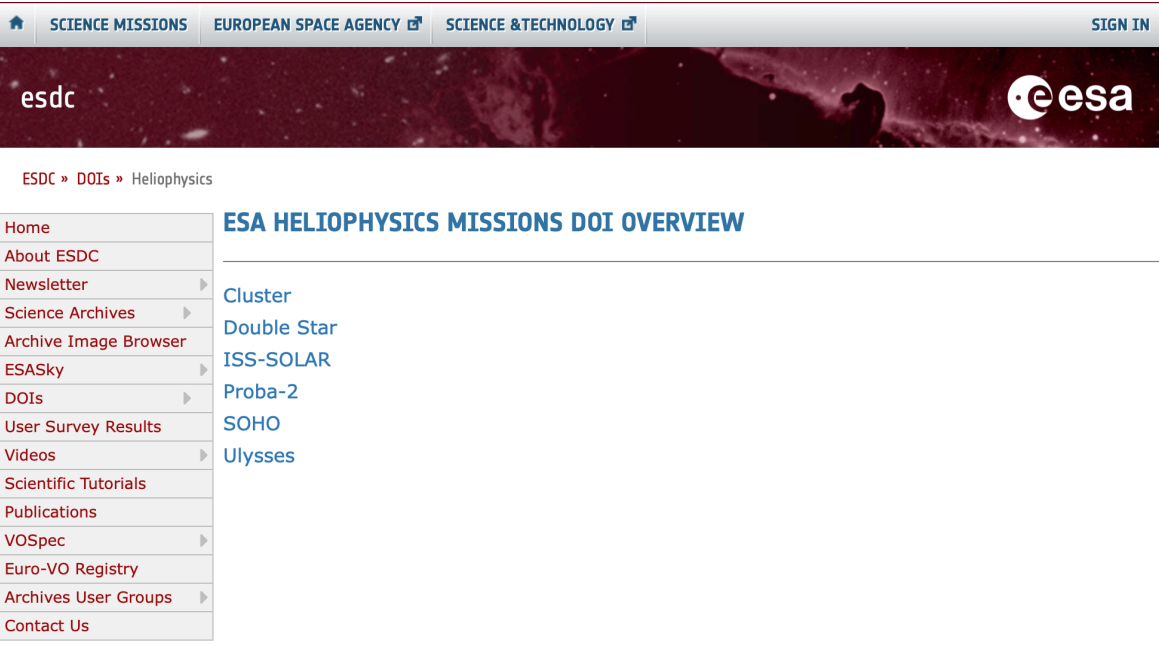
Updated	Description	Notes
2020-09-10	<ul style="list-style-type: none">• Add Housekeeping, Telemetry, RotationMatrix, EncodedParameter, AutoSpectrum, Coherence, ImaginaryPart, RealPart, PowerSpectralDensity, ChargeFlux, DynamicPressure, EnergyPerCharge, ParticleRigidity, MassPerCharge, LShell, MissionPrincipalInvestigator, ProgramManager, ProgramScientist, VolumeEmissionRate, SPICE, MissionManager to dictionary and to appropriate enumerations as suggested by L. Bargatze• Add PDS4 and PDS3 to dictionary and to FOrmat enumeration as suggest by A. Masson.	Decided during the telecon on 2020-08-06.
2020-09-30	<ul style="list-style-type: none">• Add InstrumentGroupID and Experiment to dictionary• Add InstrumentGroupID to Instrument and Experiment to InstrumentType.	Decided during the telecon on 2020-09-24.
2020-10-08	<ul style="list-style-type: none">• Add InstrumentLead to dictionary and to Role.	Decided during the telecon on 2020-10-08.
2020-10-15	<ul style="list-style-type: none">• Released.	Decided during the telecon on 2020-10-15.

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cosmos.esa.int/web/esdc/doi/heliophysics



These missions overall carry
47 experiments => 47 DOI

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ESA

A dataset provided by the European Space Agency



Name	MAG, MAGnetometer
Mission	Solar Orbiter
URL	http://soar.esac.esa.int/
DOI	10.5270/esa-
Abstract	The Solar Orbiter magnetometer is a conventional dual fluxgate design. Two sensors are accommodated on the spacecraft boom: MAG-IBS and MAG-OBS. A dual sensor configuration provides redundancy and, since they are at different distances from the spacecraft body (approx. 1 m for IBS and 3 m for OBS), also allows gradiometer magnetometer characterisation of spacecraft signals in flight. The instrument noise floor has been successfully tested at 10 pT Hz ^{-1/2} at 1 Hz.
Description	Calibrated magnetic field data in RTN coordinates and in the spacecraft reference frame. Field vector components are given in units of nanoteslas and in RTN coordinates, where R is the Sun-spacecraft axis, T is the cross product of the solar rotation axis and R, and N is the cross product of R and T. During cruise phase, MAG is operating at 1 vector/s cadence. After the cruise phase, MAG is expected to operate continuously at 16 vectors/s cadence (normal mode) except during 1 hour per day at 128 Hz or during 2 hours at 64 Hz (Burst mode). Alternatively, burst modes will be triggered in coordination with other in-situ instruments' burst modes.
Publication	Horbury, A., et al., The Solar Orbiter magnetometer, <i>Astron. Astrophys.</i> , 2020; DOI: doi.org/10.1051/0004-6361/201937257
Temporal Coverage	2020-05-01 - present
Mission Description	<p>Solar Orbiter is a mission of international collaboration between ESA and NASA. It explores the Sun and the heliosphere from close up and out of the ecliptic plane. Launched on 10 February 2020, it aims to address the overarching science question: how does the Sun create and control the Heliosphere – and why does solar activity change with time? To answer it, the Solar Orbiter spacecraft is cruising to a unique orbit around the Sun, eventually reaching a minimum perihelion of 0.28 AU, and performing measurements out of the ecliptic plane: reaching 18° heliographic latitude during its nominal mission phase, and above 30° during its extended mission phase. It carries six remote sensing instruments to observe the Sun and the solar corona, and four in-situ instruments to measure the solar wind, its thermal and energetic particles, and electromagnetic fields</p> <p>Müller, D., O.C. St. Cyr, I. Zouganelis, et al., <i>Astron. Astrophys.</i>, 2020; DOI: doi.org/10.1051/0004-6361/202038467 Müller, D., Marsden, R.G., St. Cyr, O.C. et al., <i>Solar Orbiter</i>, <i>Sol. Phys.</i>, 285, 25–70 (2013); doi.org/10.1007/s11207-012-0089-7</p>
Creator Contact	Prof. T. Horbury, Principal Investigator, Imperial College, United Kingdom, t.horbury@imperial.ac.uk
Publisher And Registrant	European Space Agency

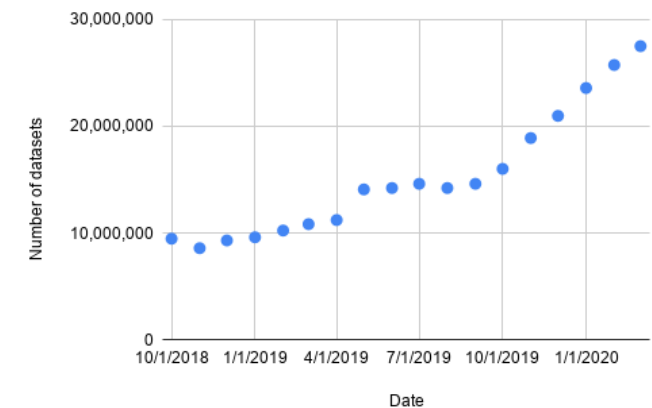
4. DOI at ESDC



Google Dataset Search (GDS) is a new search engine from Google, launched in January 2020.
<https://datasetsearch.research.google.com>

To get indexed, GDS requires to include a **JSON script** with at least **two compulsory properties**: name and description

```
<script type=application/ld+json>
{
  @context: http://schema.org/
  @type: Dataset
  name: GOLF
  description: Global Oscillations at Low Frequencies
}
</script>
```



Google
Dataset Search


4. DOI at ESDC

Schema.org property used in Heliophysics DOI landing pages JSON script	Google Dataset Search compliance	Remark
@context	Compliant	
@type	Compliant	
name	Compliant	
alternate name	Compliant	This has been used to specify the mission, as sometimes the same type of experiment with the same name has been used on multiple missions like FGM, PEACE or ASPOC. It could also be used to specify the names of the different instruments of an experiment.
citation	Compliant	Key scientific paper listed, those agreed with PS/PI. At the moment, only one reference is linked (May 2020)
identifier	Compliant	this should be the DOI address
creator	Compliant	The creator or author of a dataset. To uniquely identify individuals, Google advises to use ORCID ID as the value of the <code>sameAs</code> property of the <code>Person</code> type. To uniquely identify institutions and organizations, use ROR ID . Implemented when available.
publisher	Compliant	Contains web address and new ESA logo
distribution	Compliant	Direct link to data download. Added when relevant, like for mission long files for SOHO.
temporalCoverage	Compliant	Correct format implemented
dateModified	Compliant	Added when dataset was updated recently, or last update is known
description	Compliant	Abstract content added before dataset description content, double quotes and HTML tags for hyperlinks removed. Link to the ESDC archive added.
keywords	Compliant	Keywords agreed with PS/PI
audience	Compliant	Manually edited per mission to fit scientific communities

Table 1. Schema.org properties used in the Heliophysics DOI landing pages



Please search 'SOHO GOLF' @ <https://datasetsearch.research.google.com>




Q SOHO GOLF X

! !


⋮ A

Last updatedDownload formatUsage rightsTopicFreeSaved data sets


5 data sets found




GOLF, Global Oscillations at Low Frequencies
archives.esac.esa.int
fits
Updated Aug 30, 2019




SOHO/Global Oscillations at Low Frequencies (GOLF) Data Archive
cmr.earthdata.nasa.gov
Updated Jul 25, 2018




Global Oscillation at Low Frequencies (GOLF)
hpde.io
Updated May 5, 2019



VIRGO, Variability of solar IRradiance and Gravity...
archives.esac.esa.int
ascii, fits
Updated Jan 10, 2020



Solar acoustic modes in period 1996-2014
search.datacite.org
Updated 2015




GOLF, Global Oscillations at Low Frequencies
Experiment onboard the ESA/NASA SOHO mission
Related Article
Explore at archives.esac.esa.int
64 scholarly articles cite this data set (View in Google Scholar)
fits
Unique identifier
<https://doi.org/10.5270/esa-ls55aku>
Data set updated Aug 30, 2019
Data set provided by
European Space Agency
Authors
Dr. Patrick Boumier, Institut d'Astrophysique Spatiale, France
Time period covered
Jan 1, 1996 - Present
Description
The GOLF experiment on the SOHO mission aims to study the internal structure of the Sun by measuring the spectrum of global oscillations in the frequency range 1e-7 to 1e-2 Hz. Both p and g mode oscillations are investigated, with the emphasis on the low order long period waves which penetrate the solar core. The instrument employs an extension to space of the proven ground-based technique for measuring the mean line-of-sight velocity of the viewed solar surface. By avoiding the atmospheric disturbances experienced from the ground, and choosing a non-eclipsing orbit, GOLF improves the instrumental sensitivity limit by an order of magnitude to 1 mm/s over 20 days for frequencies higher than 2e-4 Hz. A sodium vapour resonance cell is used in a longitudinal magnetic field to sample the two wings of the solar absorption line. The addition of a small modulating field component enables the slope of the wings to be measured. This provides not only an internal calibration of the instrument sensitivity, but also offers a further possibility to recognise, and correct for, the solar background signal produced by the effects of solar magnetically active regions. The use of an additional rotating polariser enables measurement of the mean solar line-of-sight magnetic field, as a secondary objective. All SOHO/GOLF data are available from the public SOHO data archive at <https://www.cosmos.esa.int/web/soho/soho-science-archive>. GOLF key scientific data products are mission long files related to calibrated line-of-sight velocities based on measurements collected either through the instrument PhotoMultiplier 1 (PM1), PhotoMultiplier 2 (PM2), or a mean of the two signals (PM1+PM2). The calibration of these data is based on method described in Appourchaux et al., 2018. These mission long files are directly downloadable at <https://www.cosmos.esa.int/web/soho/mission-long-files>

Experiment name
Mission
Link to key reference article
Link to DOI at ESA (see next slide)
Relation to Google Scholar
Data format
DOI (URL)
Last updated
Data publisher
PI+affiliation
Time coverage

5. ESDC within VSO




- On-going activity within the VSO to request data through our TAP server (thanks to J.Ireland/E. Mansky)
- Proba-2 LYRA/DSLPL data will be first
- Once done, Solar Orbiter should be straightforward
- Eventually SOHO as well



VSO Time / Instrument Search Form

Version 1.4



All from Provider	All from	Source	Instrument	Date Range
<input type="checkbox"/> HAO	<input type="checkbox"/>	MLSO	<input type="checkbox"/> K-Cor <input type="checkbox"/> chp <input type="checkbox"/> dpm <input type="checkbox"/> mk4 <input type="checkbox"/> cp <input type="checkbox"/> BE-Continuum <input type="checkbox"/> BE-Halphi <input type="checkbox"/> Cooke_Refractor <input type="checkbox"/> AIA <input type="checkbox"/> HMI <input type="checkbox"/> ChroTel	2013.09.30 → 1996.04.20 – 2013.08.02 1994.02.20 – 2010.02.23 1998.10.01 – 2013.07.20 1980.03.02 – 1989.11.18 2010.05.20 → 2010.05.20 → 2009.01.01 → 2010.05.12 → 2010.03.29 → 2012.04.01 →
<input type="checkbox"/> INAF-OACT	<input type="checkbox"/>	SMM OACT	<input type="checkbox"/> CAII <input type="checkbox"/> FILM <input type="checkbox"/> HA2 <input type="checkbox"/> KPDC <input type="checkbox"/> PHOKA <input type="checkbox"/> TM-1001 <input type="checkbox"/> TM-1010 <input type="checkbox"/> EVE <input type="checkbox"/> IRIS <input type="checkbox"/> RHessi <input type="checkbox"/> SJ <input type="checkbox"/> SP1 <input type="checkbox"/> SP2 <input type="checkbox"/> Hi-C <input type="checkbox"/> Hi-C21 <input type="checkbox"/> BCS	2010.07.31 → 1973.05.05 – 2000.03.10 2008.06.01 → 2007.07.02 → 1989.03.27 – 2007.06.13 1998.09.24 – 2005.07.12 2005.07.13 – 2010.09.22 2010.04.30 → 2013.07.16 → 2002.02.12 → 2019.04.11 – 2019.04.11 2019.04.11 – 2019.04.11 2019.04.11 – 2019.04.11 2012.07.11 – 2012.07.11 2018.05.29 – 2018.05.29 1991.09.01 – 2001.12.14
<input type="checkbox"/> JSOC		SDO		
<input type="checkbox"/> KIS (unavailable)		ChroTel		
<input type="checkbox"/> KSO		KSO		
<input type="checkbox"/> LASP		SDO		
<input type="checkbox"/> LMSAL		IRIS		
<input type="checkbox"/> LSPP		RHessi		
<input type="checkbox"/> MSFC	<input type="checkbox"/>	CLASP2		
	<input type="checkbox"/>	Hi-C		
	<input type="checkbox"/>	Hi-C21		
<input type="checkbox"/> MSU		YOHKOH		

Start: 2020 Sep 22 / 09 : 00

End: 2020 Sep 22 / 12 : 59

IHDEA on ESA Confluence

- Public access to IHDEA minutes on Confluence at <https://issues.cosmos.esa.int/socciwiki/display/HELIOPHYSICSEXT1/Heliophysics+Archives+Public+Area+Home>
- Private access possible for Exec and WG members
- Share files is possible
- Export to MSword and PDF
- Get notifications when update is posted is possible
- Group chat not possible: Slack?

The screenshot shows a web browser window displaying the '3rd IHDEA meeting' page on the SOCCI Confluence site. The browser's address bar shows the URL: issues.cosmos.esa.int/socciwiki/display/HELIOPHYSICSEXT1/3rd+IHDEA+meeting. The page header includes navigation links for 'SOCCI Confluence', 'Spaces', and 'Glossaries', along with a search bar and a 'Log in' button. The main content area is titled '3rd IHDEA meeting' and indicates it was created by Arnaud Masson and last modified on 18 Nov. 2019. The page is organized into sections: 'October 16, 2019 (Wednesday) ADNET Office', '8:30 Welcome message – Mario Maddox (Assist. Director of Heliophysics Science Division, GSFC)', '8:45 Introduction – Aaron Roberts, Arnaud Masson, Shing Fung', '9:00-11:50 – IHDEA organization' (which includes a list of topics like Charter document, Mission statement, Scope, Objectives, Membership, and Structure, Governance, Intellectual Property), '12:00-12:50 - Lunch', and '1:00-5:10 - IHDEA components' (which includes a list of data archives/repositories like NASA-SPDF, NASA-SDAC/VSO, ESA ESDC, and Hinode Project and Science Center). The left sidebar shows a 'PAGE TREE' with links to 'IHDEA' and '3rd IHDEA meeting', and a 'TITLE TREE' section.

