ESA highlights related to IHDEA

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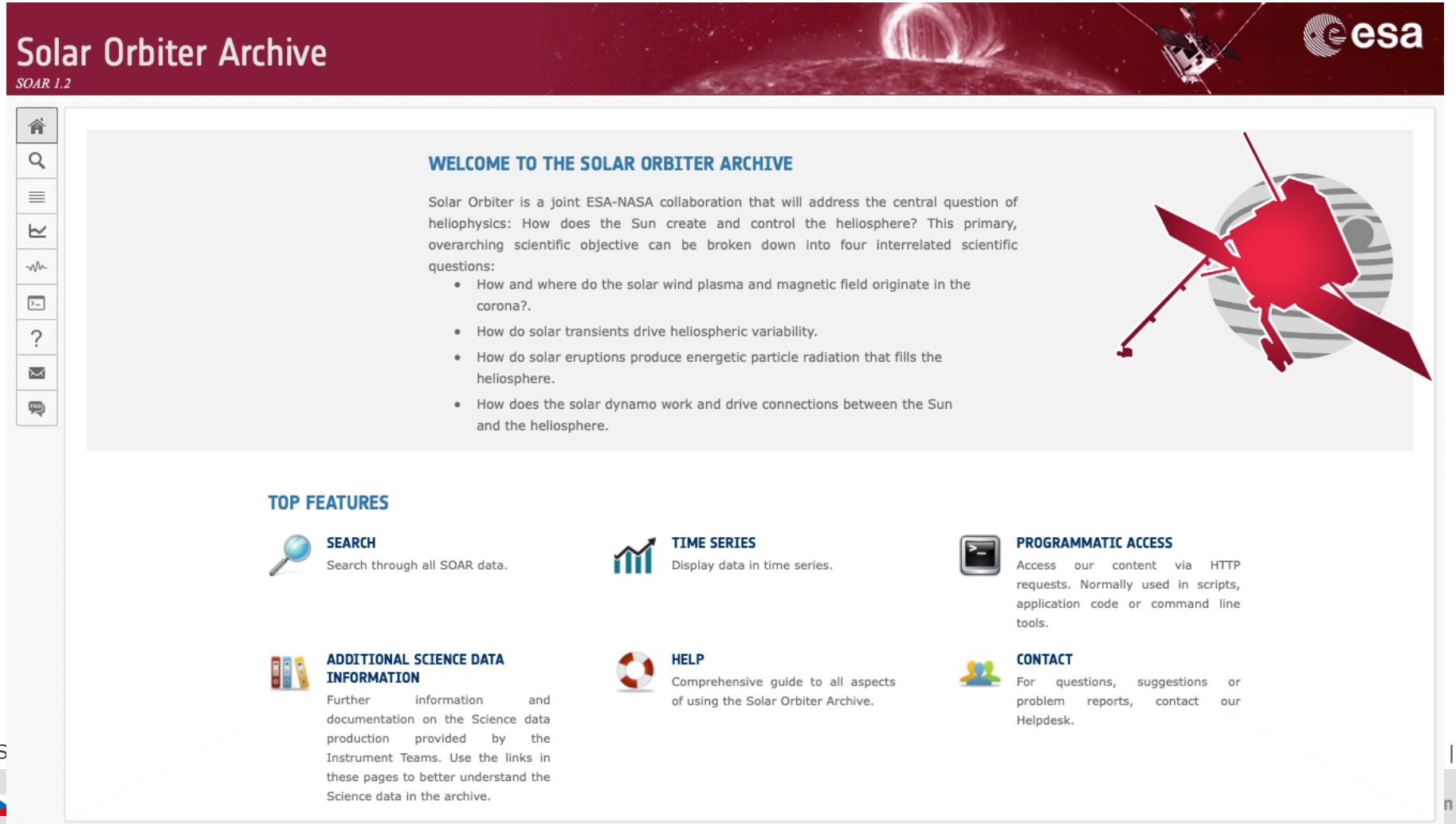
Plenary IHDEA meeting
19 October 2020

Outline

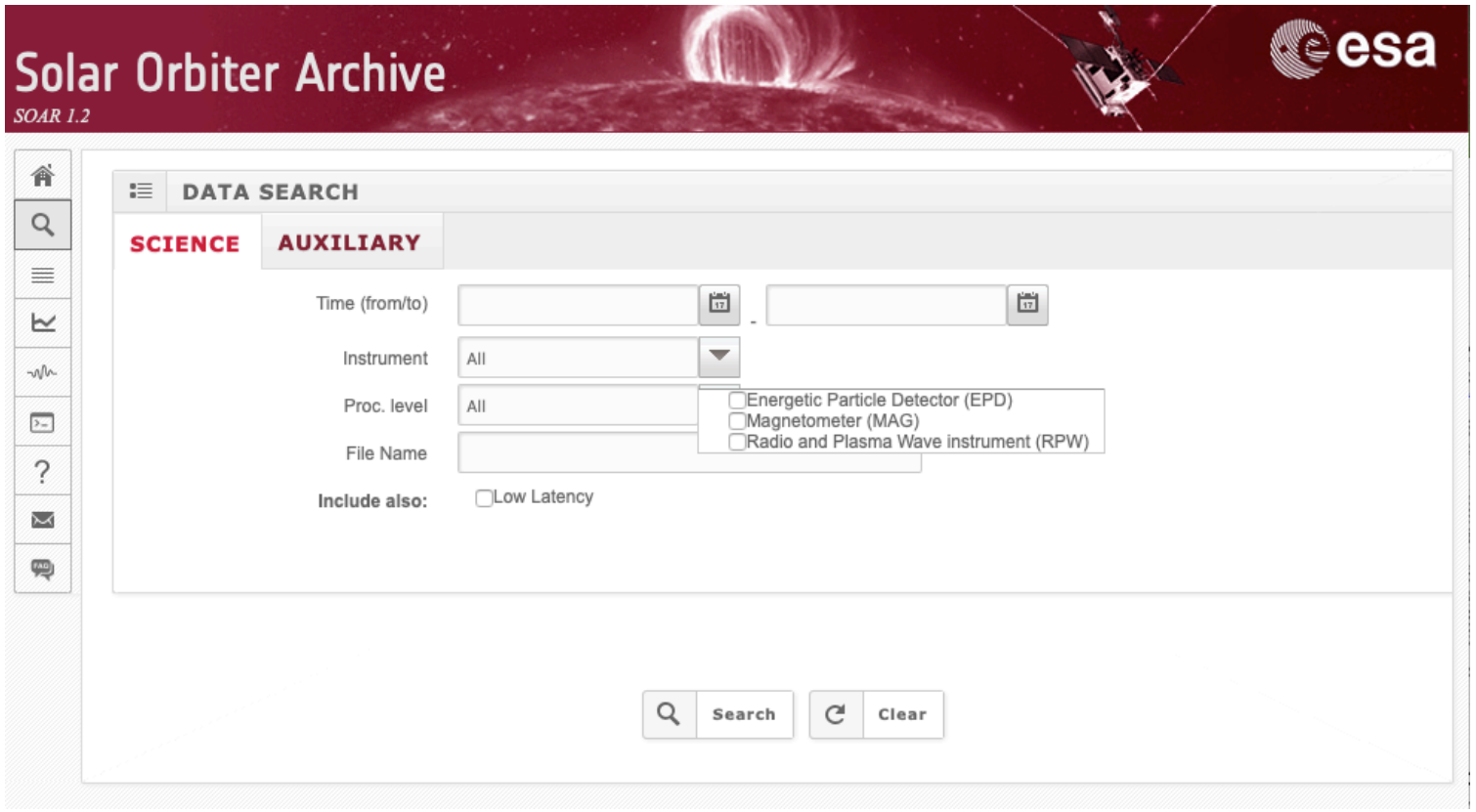
1. Solar Orbiter archive now public!
2. Cluster data on SPEDAS, no credentials on RestAPI, HAPI
3. BepiColombo/JUICE SOC request -> SPASE data model 2.3.2
4. DOI related to experiments on ESA heliophysics spacecraft
5. ESDC within VSO: start with Proba-2 then Solar Orbiter, eventually SOHO

1. Solar Orbiter ARchive (SOAR): now public! http://soar.esac.esa.int



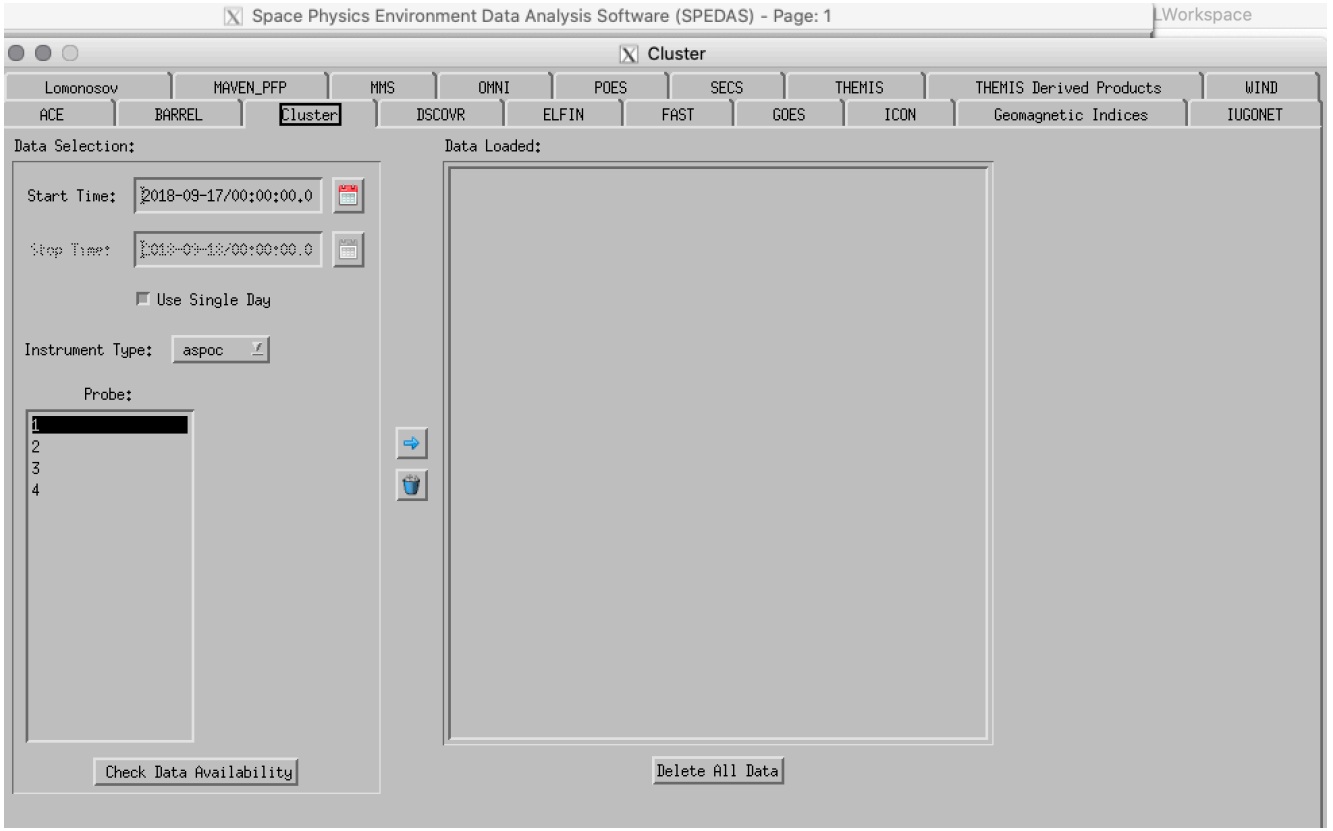
1. Solar Orbiter ARchive (SOAR): now public ! http://soar.esac.esa.int

- 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



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



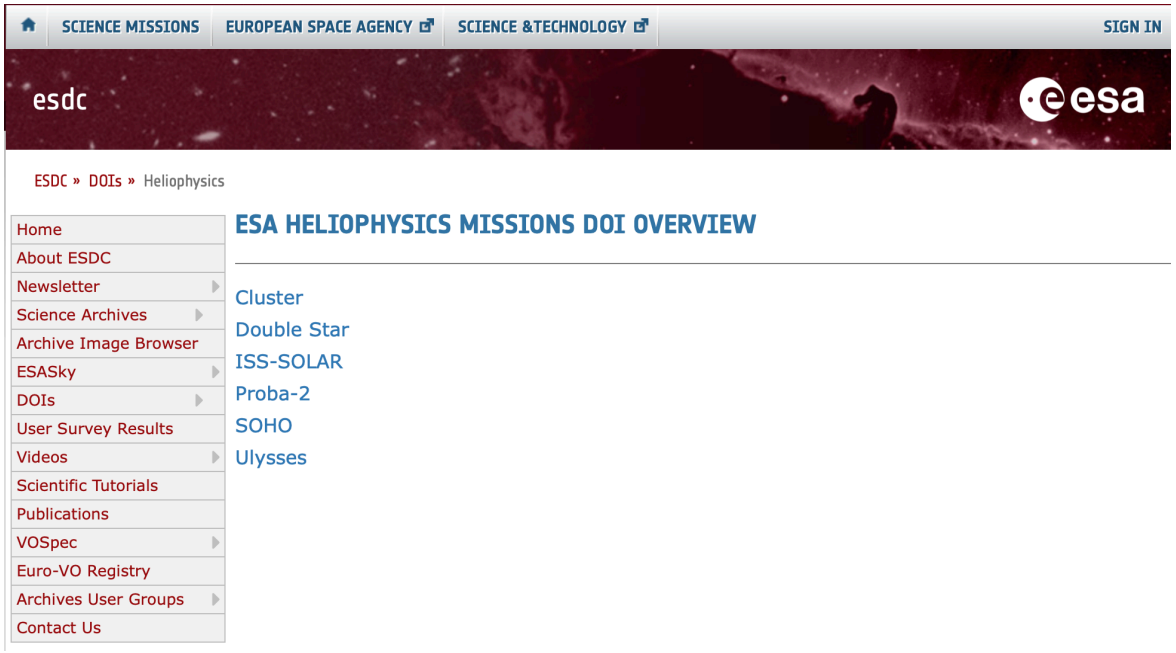
3. BepiColombo/JUICE request → SPASE 2.3.2

- 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	• 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	• 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	• Add InstrumentLead to dictionary and to Role.	Decided during the telecon on 2020-10-08.
2020-10-15	• Released.	Decided during the telecon on 2020-10-15.

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



These missions overall carry
47 experiments => 47 DOI

A dataset provided by the European Space Agency

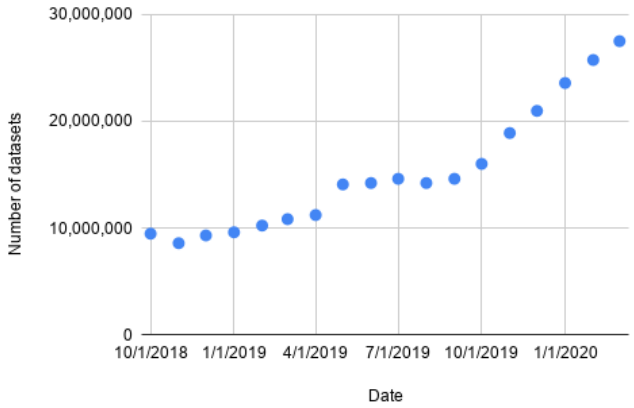
Name	MAG, MAGnetometer
Mission	Solar Orbiter
URL	http://soar.esac.esa.int/
DOI	10.5270/esa-
Abstract	The Solar Orbiter magnetometer is a conventional dual fluxgate design. Two sensors are accommodated on the spacecraft boom: MAG-IBS and MAG-OBS. A dual sensor configuration provides redundancy and, since 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 units of nanoteslas and in RTN coordinates, where R is the Sun-spacecraft axis, T is the cross product of the solar rotation a 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, Astron. Astrophys., 2020; DOI: doi.org/10.1051/0004-6361/201937257
Temporal Coverage	2020-05-01 - present
Mission Description	Solar Orbiter is a mission of international collaboration between ESA and NASA. It explores the Sun and the heliosphere fron 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 Müller, D., O.C.St. Cyr, I. Zouganelis, et al., Astron. Astrophys., 2020; DOI: doi.org/10.1051/0004-6361/202038467 Müller, D., Marsden, R.G., St. Cyr, O.C. et al., Solar Orbiter, Sol. Phys., 285, 25–70 (2013); doi.org/10.1007/s11207-012-008
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>
```



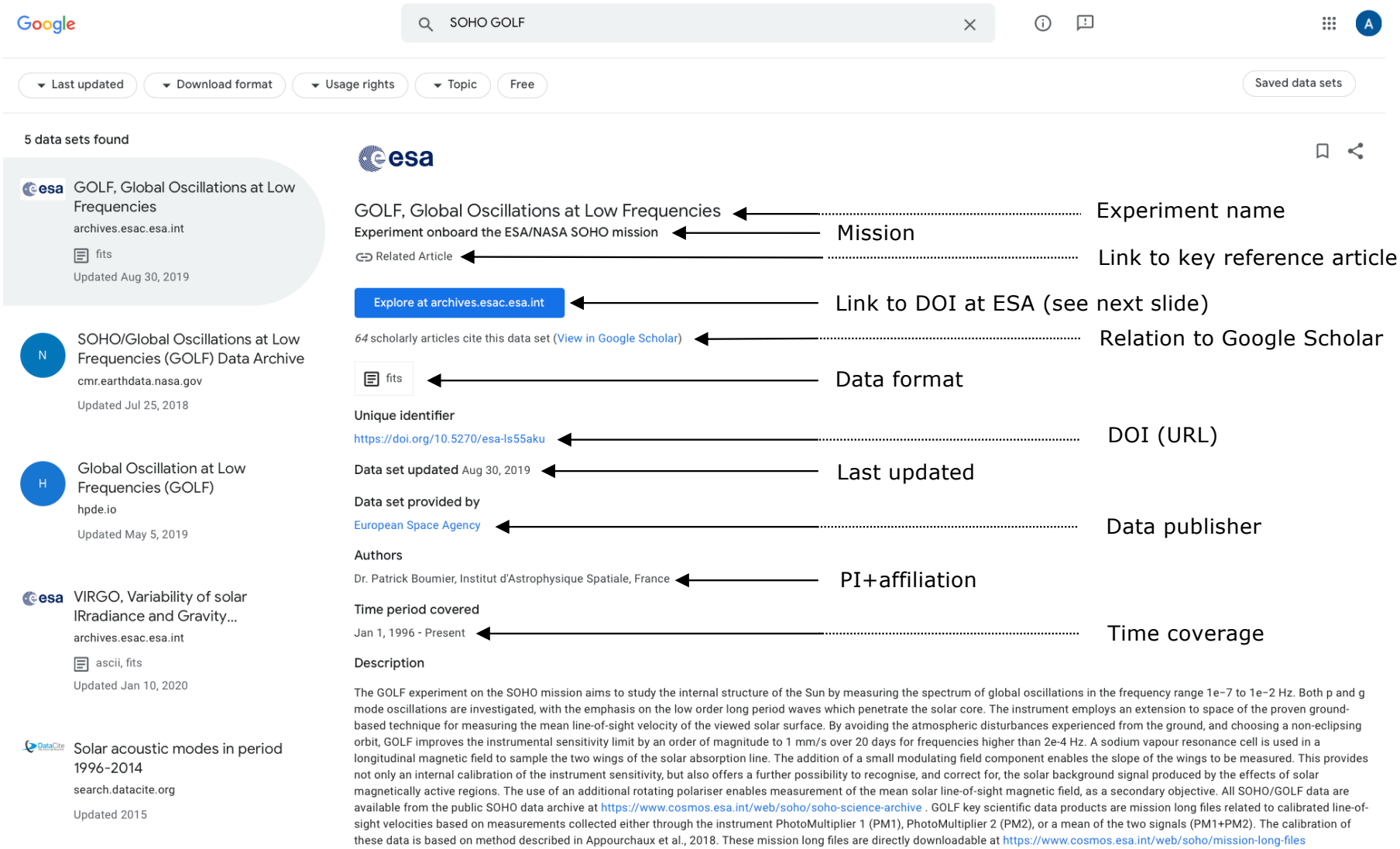
Google Dataset Search

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 `sameAs` property of the `Person` 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

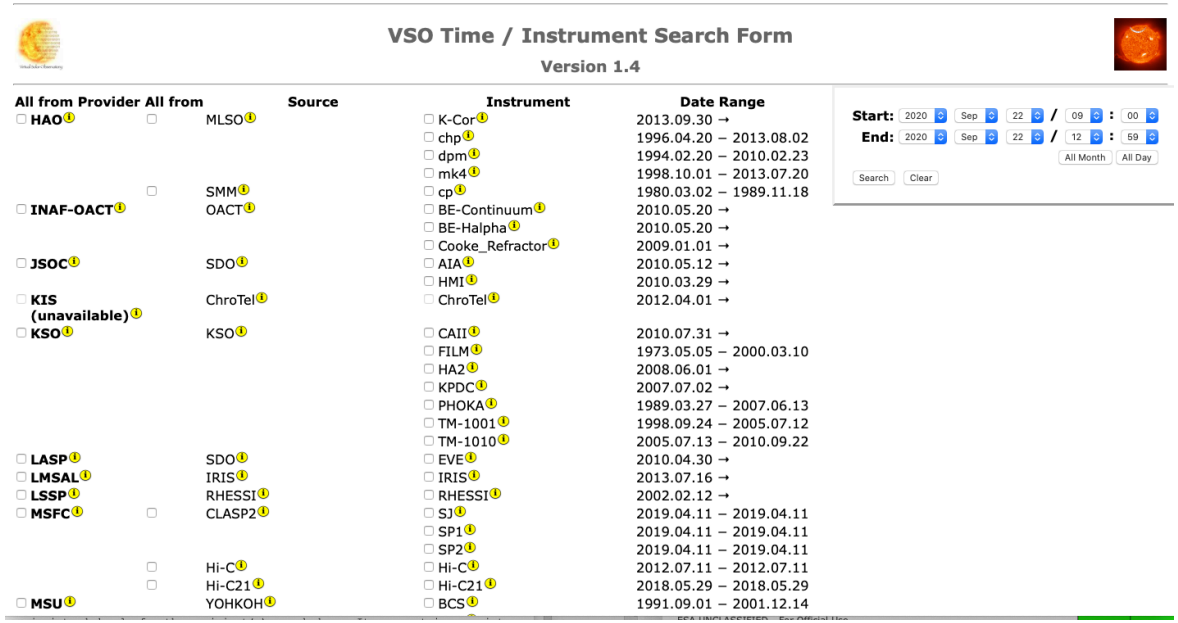
Table 1. Schema.org properties used in the Heliophysics DOI landing pages

Please search ‘SOHO GOLF’ @ https://datasetsearch.research.google.com



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/DSLP data will be first
- Once done, Solar Orbiter should be straightforward
- Eventually SOHO as well



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?