

Solar Orbiter ARchive (SOAR) Status

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Solar Orbiter SOWG

11/07/2023

- Overall status
- new Beta:
 - Asynchronous download
 - Updated TAP tables allowing more flexible data requests
 - Deactivated files – searching on GUI and TAP
 - JP2 files – correct end times
 - Lower case descriptors
- Metadata Standard
 - HTTP_LINK and DOIs
 - Matters to discuss (light-time correction and DOIs)
 - State of SOOP metadata
- News on direct data transfer
- Datalabs
- Help pages



| Month | Number of Active Users |
|----------|------------------------|
| Feb 2020 | 0 |
| Mar 2020 | 30 |
| Apr 2020 | 5 |
| May 2020 | 22 |
| Jun 2020 | 16 |
| Jul 2020 | 42 |
| Aug 2020 | 79 |
| Sep 2020 | 122 |
| Oct 2020 | 64 |
| Nov 2020 | 104 |
| Dec 2020 | 78 |
| Jan 2021 | 80 |
| Feb 2021 | 62 |
| Mar 2021 | 135 |
| Apr 2021 | 73 |
| May 2021 | 71 |
| Jun 2021 | 53 |
| Jul 2021 | 32 |
| Aug 2021 | 60 |
| Sep 2021 | 93 |
| Oct 2021 | 98 |
| Nov 2021 | 69 |
| Dec 2021 | 74 |
| Jan 2022 | 107 |
| Feb 2022 | 130 |
| Mar 2022 | 98 |
| Apr 2022 | 129 |
| May 2022 | 117 |
| Jun 2022 | 87 |
| Jul 2022 | 51 |
| Aug 2022 | 110 |
| Sep 2022 | 137 |
| Oct 2022 | 136 |
| Nov 2022 | 100 |
| Dec 2022 | 110 |
| Jan 2023 | 150 |
| Feb 2023 | 135 |
| Mar 2023 | 143 |
| Apr 2023 | 150 |
| May 2023 | 130 |

The bar chart displays the monthly volume of data downloaded in GB. The y-axis is labeled 'Volume of data downloaded (GB)' and ranges from 0.0 to 3,000.0 in increments of 500.0. The x-axis shows months from February 2020 to June 2023. The data shows a general upward trend with several peaks. A notable peak occurs in early 2021, reaching approximately 800 GB. A much larger peak is observed in early 2023, reaching nearly 2,400 GB. The volume of data downloaded is consistently low (below 100 GB) from February 2020 through late 2020 and early 2021.

| Month | Volume of data downloaded (GB) |
|----------|--------------------------------|
| Feb 2020 | 0.0 |
| Mar 2020 | 0.0 |
| Apr 2020 | 0.0 |
| May 2020 | 0.0 |
| Jun 2020 | 0.0 |
| Jul 2020 | 0.0 |
| Aug 2020 | 0.0 |
| Sep 2020 | 0.0 |
| Oct 2020 | 0.0 |
| Nov 2020 | 0.0 |
| Dec 2020 | 100.0 |
| Jan 2021 | 300.0 |
| Feb 2021 | 150.0 |
| Mar 2021 | 800.0 |
| Apr 2021 | 250.0 |
| May 2021 | 250.0 |
| Jun 2021 | 100.0 |
| Jul 2021 | 250.0 |
| Aug 2021 | 80.0 |
| Sep 2021 | 10.0 |
| Oct 2021 | 10.0 |
| Nov 2021 | 100.0 |
| Dec 2021 | 50.0 |
| Jan 2022 | 80.0 |
| Feb 2022 | 100.0 |
| Mar 2022 | 80.0 |
| Apr 2022 | 200.0 |
| May 2022 | 700.0 |
| Jun 2022 | 100.0 |
| Jul 2022 | 250.0 |
| Aug 2022 | 300.0 |
| Sep 2022 | 50.0 |
| Oct 2022 | 150.0 |
| Nov 2022 | 180.0 |
| Dec 2022 | 680.0 |
| Jan 2023 | 650.0 |
| Feb 2023 | 180.0 |
| Mar 2023 | 580.0 |
| Apr 2023 | 750.0 |
| May 2023 | 2400.0 |
| Jun 2023 | 400.0 |
| Jul 2023 | 500.0 |

This line chart illustrates the total size in Terabytes (TB) over time, from February 2020 to June 2023. The y-axis represents the total size in TB, ranging from 0.0 to 40.0 in increments of 2.0. The x-axis shows time in two-month intervals. The data shows a steady increase in size over the period, starting near 0 TB in Feb 2020 and reaching approximately 27 TB by Jun 2023.

| Date | Total Size (TB) |
|----------|-----------------|
| Feb 2020 | 0.0 |
| Apr 2020 | 0.0 |
| Jun 2020 | 0.0 |
| Aug 2020 | 0.2 |
| Oct 2020 | 0.5 |
| Dec 2020 | 1.0 |
| Feb 2021 | 1.5 |
| Apr 2021 | 2.0 |
| Jun 2021 | 2.5 |
| Aug 2021 | 3.0 |
| Oct 2021 | 4.0 |
| Dec 2021 | 6.0 |
| Feb 2022 | 8.0 |
| Apr 2022 | 10.0 |
| Jun 2022 | 12.0 |
| Aug 2022 | 14.0 |
| Oct 2022 | 15.0 |
| Dec 2022 | 18.0 |
| Feb 2023 | 22.0 |
| Apr 2023 | 24.0 |
| Jun 2023 | 27.0 |

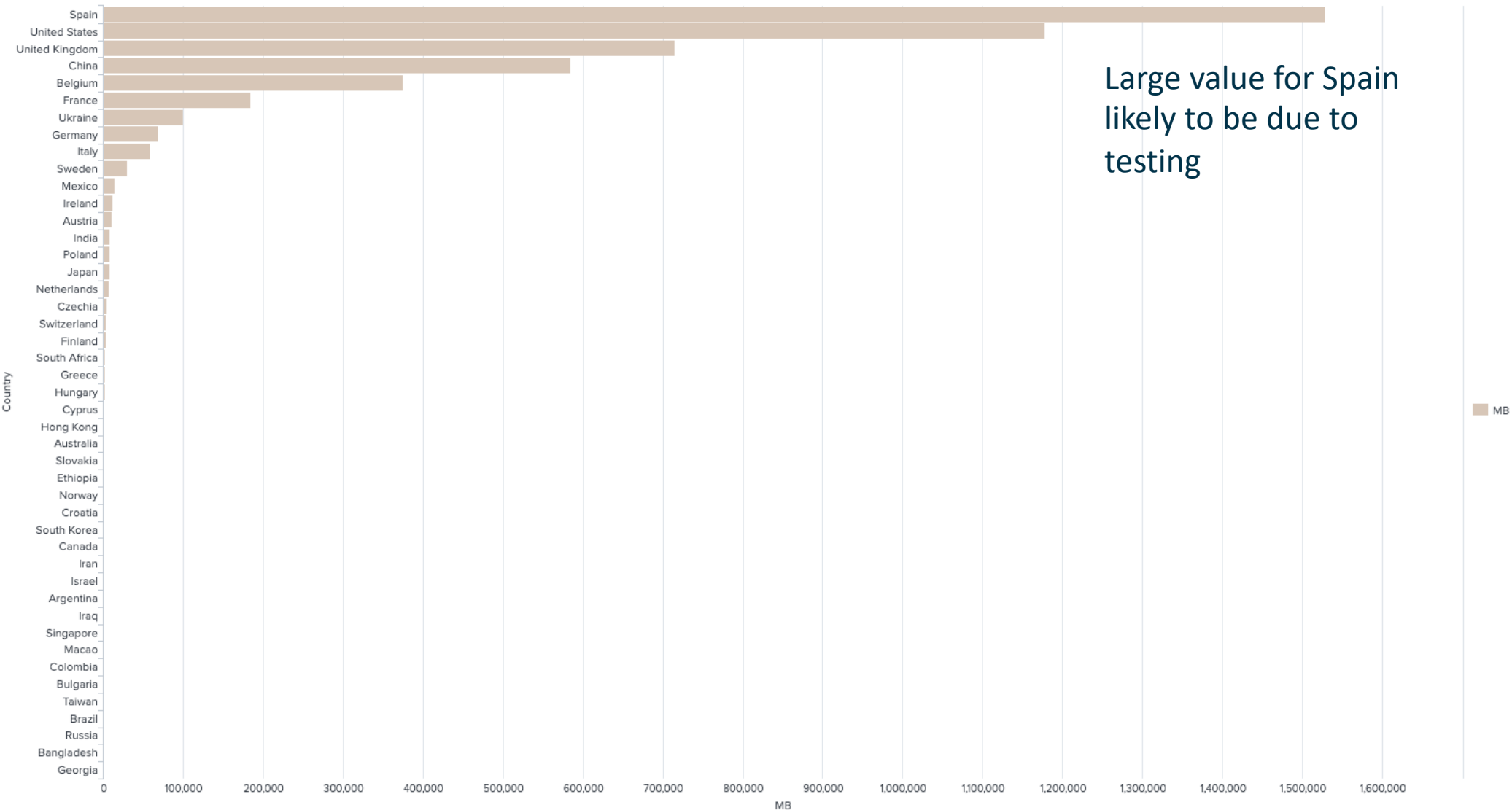
The chart displays the total database size in GB over time. The y-axis ranges from 0.0 to 200.0 GB in increments of 20.0. The x-axis shows dates from Mar 2020 to May 2023. The size starts at 0 GB in Mar 2020, remains at 0 until Sep 2020, then begins to grow. It reaches approximately 10 GB by Jan 2021, 35 GB by Jul 2021, dips to 30 GB in Sep 2021, and then continues to rise steadily to about 135 GB by May 2023.

| Date | Total DB Size (GB) |
|----------|--------------------|
| Mar 2020 | 0.0 |
| May 2020 | 0.0 |
| Jul 2020 | 0.0 |
| Sep 2020 | 0.0 |
| Nov 2020 | 2.0 |
| Jan 2021 | 10.0 |
| Mar 2021 | 12.0 |
| May 2021 | 25.0 |
| Jul 2021 | 35.0 |
| Sep 2021 | 30.0 |
| Nov 2021 | 42.0 |
| Jan 2022 | 50.0 |
| Mar 2022 | 65.0 |
| May 2022 | 70.0 |
| Jul 2022 | 85.0 |
| Sep 2022 | 95.0 |
| Nov 2022 | 105.0 |
| Jan 2023 | 115.0 |
| Mar 2023 | 125.0 |
| May 2023 | 135.0 |

Downloads by Country



Downloads by Country



Large value for Spain likely to be due to testing

MB



SOAR Release 1.11.0

- Enhanced data download options
 - new asynchronous data download button
 - data download up to 50GB
 - removed 1000 file download limitation
 - enable TAP conditional downloads from data items (latest version not only all versions)
 - enhanced user interface notifications for download limits
- Upgrade to TAP 9.1.0
- Support searching for active/inactive science products (see next slide)
- Process start and end dates from JP2 files metadata
- Conversion of CDF and FITS descriptors to lower case

Should be released in the next week or so.



Async will only work for all items, and will grey out if any products are selected.

Asynchronous Download



The async button will actually provide the command line request for asynchronously downloading the results of the search that was done on the GUI.

Registration is necessary for asynchronous downloads – follow the link if not already registered.

If already registered, click the large link to start the request, or click OK to remove the message window.

The screenshot shows the Solar Orbiter Archive website interface. The top navigation bar includes the European Space Agency (ESA) logo and the text "Solar Orbiter Archive". Below this, there are tabs for "RESULTS #1", "RESULTS #2", and "RESULTS #3". The main content area displays a list of search results for "science (37432)". Each result entry includes a checkbox, an "Item Id", a "Level", a "Descriptor", "Begin Time", "End Time", "Instrument", "File Format", and "File Size".

A modal window is open in the center of the screen, displaying the following text:

This asynchronous request will bundle all the files in one tar gzipped file. You will receive an email with a link to download this tar file, when this bundle is ready for collection. For this, you must be registered (the login boxes will appear when this URL is followed if you are not already logged in):

[https://soarint.esac.esa.int/soar-si-lap-beta/data?retrieval_type=PRODUCT&QUERY=SELECT filename.filepath FROM v_sc_data_item WHERE data_type='SCI' AND \(\(instrument='EUI'\) AND \(\(level='L1'\) OR \(level='L2'\)\) AND \(\(scoop_name LIKE '%L SMALL HRES HCAD Slow-Wind-Connection%'\) OR \(scoop_type LIKE '%LS2%'\)\) AND \(is_active='true'\)\) ORDER BY begin_time ASC &retrieval_access=DEFERRED](https://soarint.esac.esa.int/soar-si-lap-beta/data?retrieval_type=PRODUCT&QUERY=SELECT filename.filepath FROM v_sc_data_item WHERE data_type='SCI' AND ((instrument='EUI') AND ((level='L1') OR (level='L2')) AND ((scoop_name LIKE '%L SMALL HRES HCAD Slow-Wind-Connection%') OR (scoop_type LIKE '%LS2%')) AND (is_active='true')) ORDER BY begin_time ASC &retrieval_access=DEFERRED)

Please note that following this link will open a new tab with an XML file that you can ignore.

OK

The modal window also includes a "Page size" dropdown menu set to "100" and a "Displaying 1-100 of 37432" indicator.

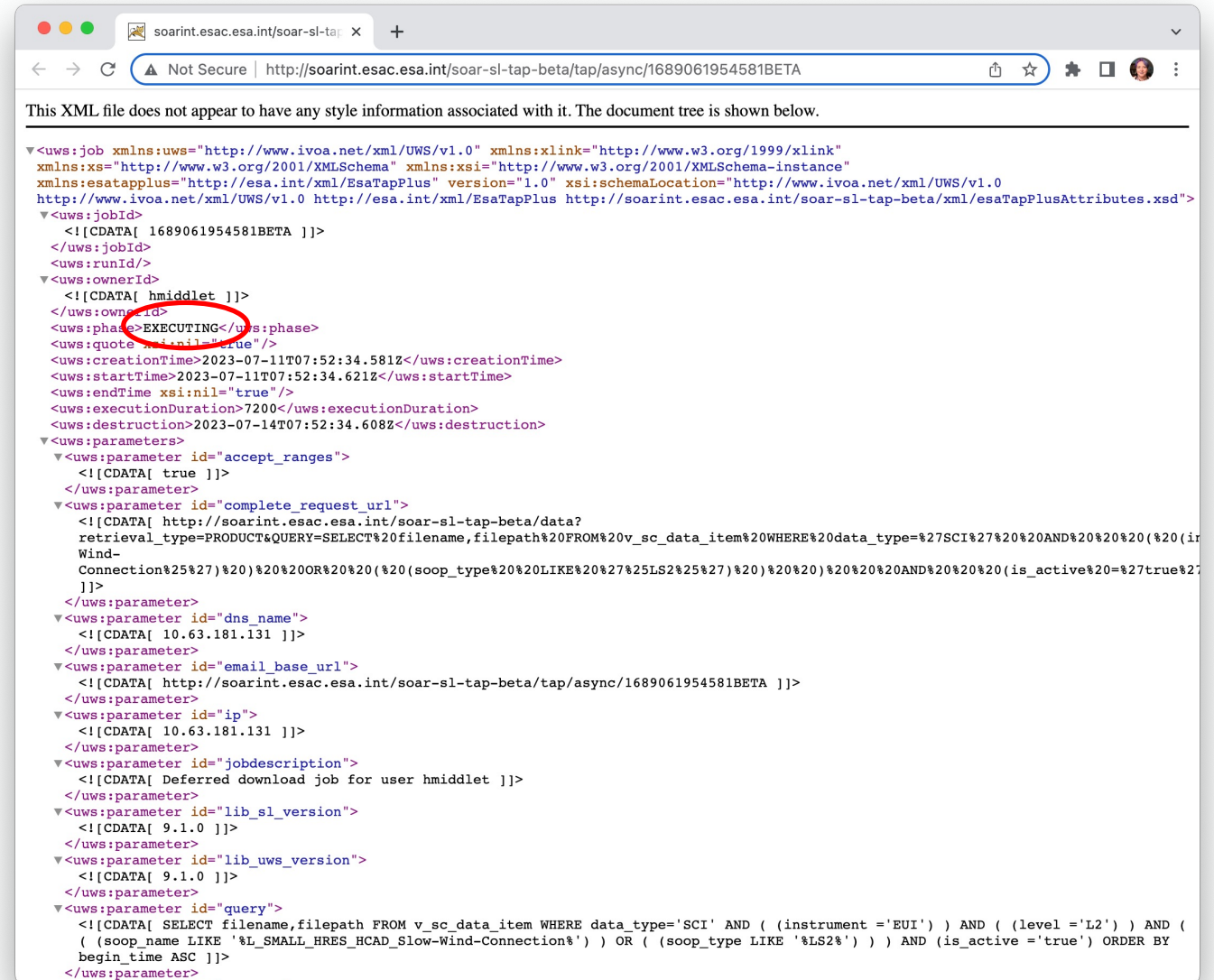
Once you've made the request (followed the long link), a new tab will open and ask you to log in.

When the request is successfully started, an XML page will appear with all the information associated with the request, including its current status – see red circle:

This is the response and can be used to automate the queries – see

<https://www.cosmos.esa.int/web/soar/asynchronousrequests>

for all the details!



<https://soar.esac.esa.int/soar-sl-tap/data?> + ...

```
retrieval_type=PRODUCT&data_item_id=solo_L2_epd-ept-north-rates_20200820,solo_L2_epd-ept-south-rates_20200820&product_type=SCIENCE
```

```
retrieval_type=PRODUCTS&data_item_id='solo_LL02_epd-ept-north-rates_20200414T000009-20200415T000008,solo_LL02_epd-ept-south-rates_20200414T000009-20200415T000008&product_type=LOW_LATENCY
```

```
retrieval_type=ALL_PRODUCTS&data_item_id=solo_L2_epd-ept-north-rates_20200820,solo_L2_epd-ept-south-rates_20200820&product_type=SCIENCE
```

```
tap/tap/sync?REQUEST=doQuery&LANG=ADQL&FORMAT=CSV&QUERY=SELECT+COUNT+(filename)+FROM+v_sc_data_item
+WHERE+soop_name+LIKE+'%25CC_OFFPOI_FLATFIELD_HR|%25'
```

```
tap/data?retrieval_type=PRODUCT&QUERY=SELECT+filepath,filename+FROM+v_sc_repository_file+WHERE+soop_name+LI  
KE+'%25CC_OFFPOI_FLATFIELD_HRI%25'
```

0

TAP requests for more files

A metadata request can contain wildcards:

```
http://soar.esac.esa.int/soar-sl-  
tap/tap/sync?REQUEST=doQuery&LANG=ADQL&FORMAT=CSV&QUERY=SELECT+COUNT+(filename)+FROM+v_sc_data_item  
+WHERE+soop_name+LIKE+'%25CC_OFFPOI_FLATFIELD_HRI%25'
```

To be able to use wildcards (% and _, equivalent to more usual * and ?) in a data request, the search is for **filepath** and **filename**:

```
http://soar.esac.esa.int/soar-sl-  
tap/data?retrieval_type=PRODUCT&QUERY=SELECT+filepath,filename+FROM+v_sc_data_item+WHERE+soop_name+LI  
KE+'%25CC_OFFPOI_FLATFIELD_HRI%25'
```

v_sc_data_item

Filename and filepath weren't available in the table for the latest data, v_sc_data_item (or v_ll_data_item) so before the Beta v1.11, large wildcard downloads were possible for table containing all versions (v_sc_repository_file), but not the from the latest version table (v_sc_data_item). BUT NOW IT'S POSSIBLE!

Background: EUI wanted to change some of their descriptors, to make them more specific:

So, for example, for the files with descriptor *eui-fsi174-image*, after Data Release 6, 1782 + 9544 new versions of the same observations would now have different names:

| | |
|-------------------------|--------|
| eui-fsi174-image | 104636 |
| eui-fsi174-image-occult | 1782 |
| eui-fsi174-image-short | 9544 |

Without deactivating the files previous to this Data Release, a file with the new name *eui-fsi174-image-occult* would show up against its old version's name *eui-fsi174-image* and that latest version of the old name would always appear in the search.

EUI wanted to change some of their descriptors, to make them more specific:

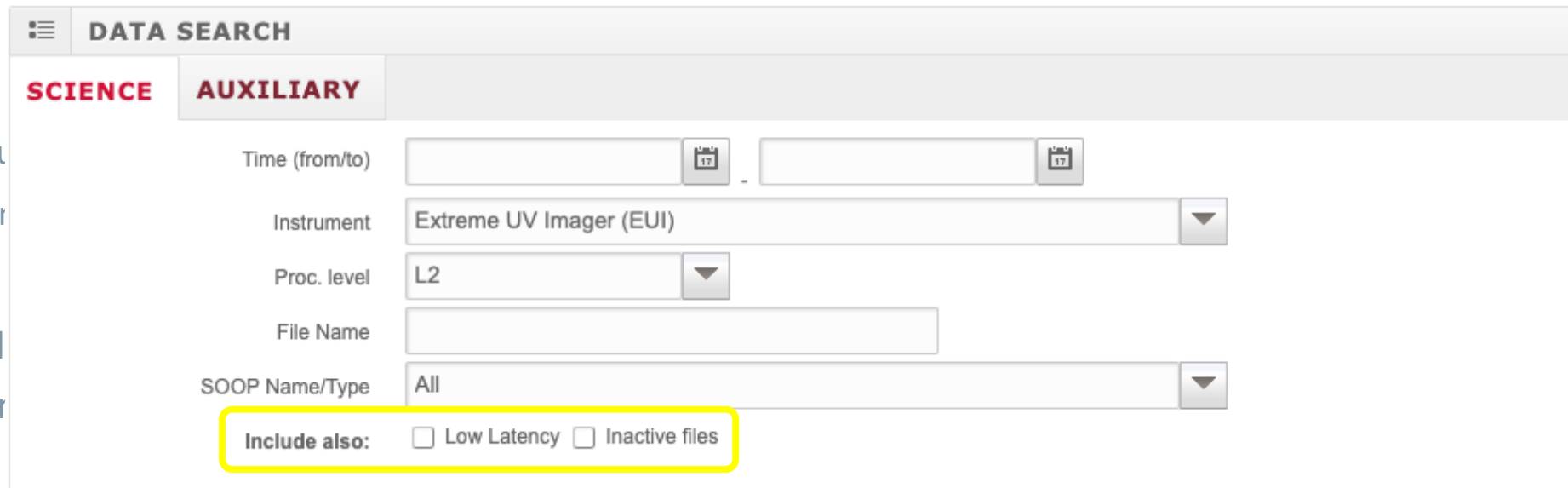
So, for example, for the files with descriptor *eui-fsi174-image*, after Data Release 6, 1782 + 9544 new versions of the same observations would now have different names:

eui-fsi174-image

eui-fsi174-image-occu

eui-fsi174-image-shor

Without deactivating the file
up against its old version's re-
search.



+ New version names included the # symbol, e.g., eui-hrievv###-image. We briefly allowed, but causes problems for downloading and mirroring the SOAR, so no longer allowed and EUI will change to xxx

Solar Orbiter Archive

Not Secure | http://soarint.esac.esa.int/soar-beta/#results

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SIGN IN

Solar Orbiter Archive

SOAR 1.11.0-beta1 - beta

RESULTS #1

science (5)

| Item Id | | Level | Descriptor | Begin Time | End Time | File Form | Archived On | Is Active |
|--|--|-------|--|-------------------------|-------------------------|-----------|-------------------------|-----------|
| solo_L3_eui-fsi174-image-occult_20200513T150204241 | | L3 | eui-fsi174-image-occult_20200513T150204241 | 2020-05-13T15:02:04.241 | 2020-05-14T15:02:04.241 | JP2 | 2023-05-30T18:15:56.796 | true |
| solo_L2_eui-fsi174-image-occult_20200513T150204241 | | L2 | eui-fsi174-image-occult_20200513T150204241 | 2020-05-13T15:02:04.241 | 2020-05-13T15:12:04.241 | FITS | 2023-05-22T09:48:12.238 | true |
| solo_L1_eui-fsi174-image-occult_20200513T150204241 | | L1 | eui-fsi174-image-occult_20200513T150204241 | 2020-05-13T15:02:04.241 | 2020-05-13T15:12:04.241 | FITS | 2023-03-03T12:14:34.359 | true |
| solo_L2_eui-fsi174-image_20200513T150204241 | | L2 | eui-fsi174-image_20200513T150204241 | 2020-05-13T15:02:04.241 | 2020-05-13T15:12:04.241 | FITS | 2022-05-10T07:32:45.286 | false |
| solo_L1_eui-fsi174-image_20200513T150204241 | | L1 | eui-fsi174-image_20200513T150204241 | 2020-05-13T15:02:04.241 | 2020-05-13T15:12:04.241 | FITS | 2022-05-12T17:18:23.186 | false |

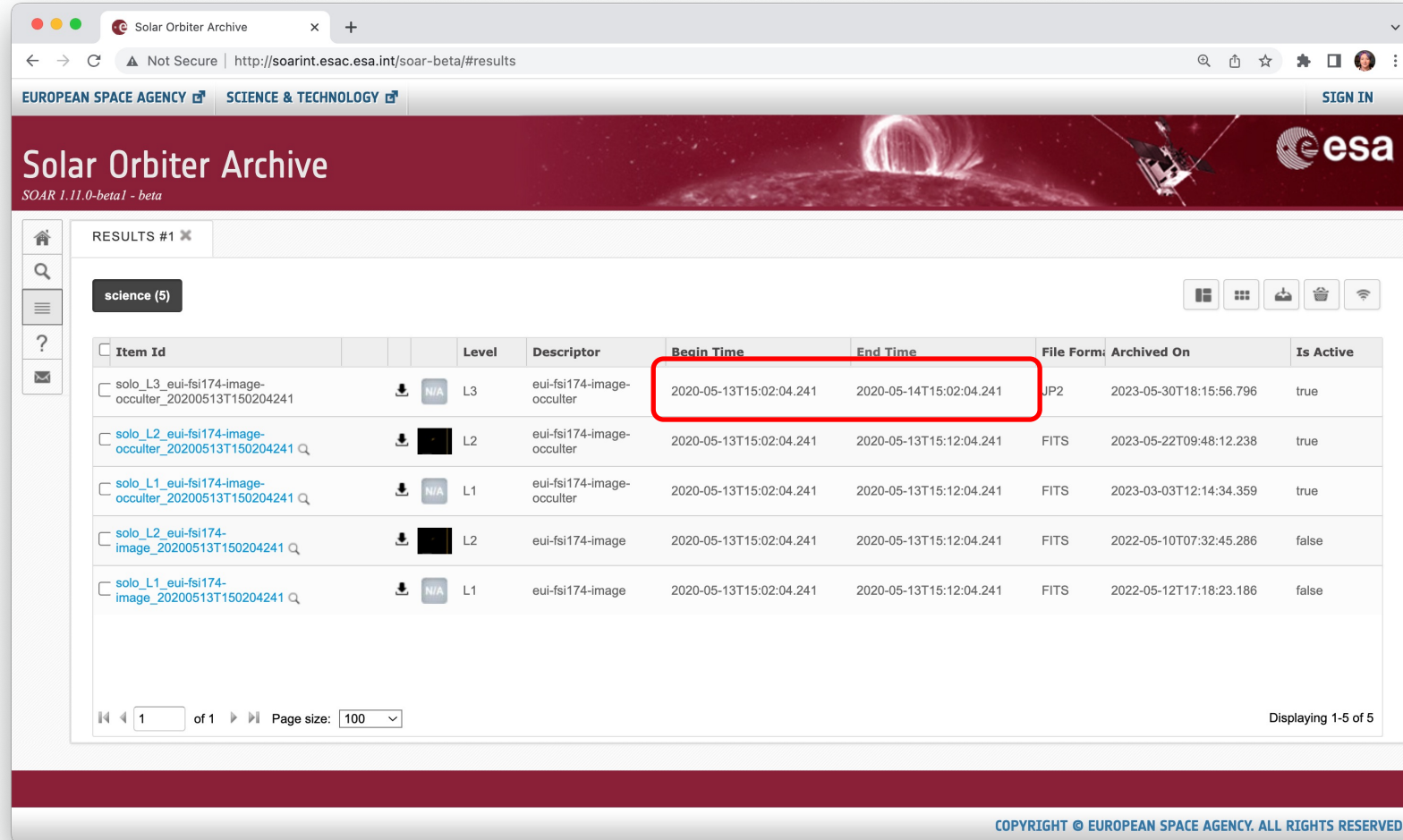
1 of 1

Page size: 100

Displaying 1-5 of 5

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JP2 metadata parsed for times (not re-ingested yet)



Solar Orbiter Archive
SOAR 1.11.0-beta1 - beta

RESULTS #1

science (5)

| Item Id | Level | Descriptor | Begin Time | End Time | File Form | Archived On | Is Active |
|--|-------|--|-------------------------|-------------------------|-----------|-------------------------|-----------|
| solo_L3_eui-fsi174-image-occult_20200513T150204241 | L3 | eui-fsi174-image-occult_20200513T150204241 | 2020-05-13T15:02:04.241 | 2020-05-14T15:02:04.241 | JP2 | 2023-05-30T18:15:56.796 | true |
| solo_L2_eui-fsi174-image-occult_20200513T150204241 | L2 | eui-fsi174-image-occult_20200513T150204241 | 2020-05-13T15:02:04.241 | 2020-05-13T15:12:04.241 | FITS | 2023-05-22T09:48:12.238 | true |
| solo_L1_eui-fsi174-image-occult_20200513T150204241 | L1 | eui-fsi174-image-occult_20200513T150204241 | 2020-05-13T15:02:04.241 | 2020-05-13T15:12:04.241 | FITS | 2023-03-03T12:14:34.359 | true |
| solo_L2_eui-fsi174-image_20200513T150204241 | L2 | eui-fsi174-image_20200513T150204241 | 2020-05-13T15:02:04.241 | 2020-05-13T15:12:04.241 | FITS | 2022-05-10T07:32:45.286 | false |
| solo_L1_eui-fsi174-image_20200513T150204241 | L1 | eui-fsi174-image_20200513T150204241 | 2020-05-13T15:02:04.241 | 2020-05-13T15:12:04.241 | FITS | 2022-05-12T17:18:23.186 | false |

Displaying 1-5 of 5















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The JP2 files weren't parsed for the metadata, so because of the default 24-hour length file if the end date isn't included in the filename, the end times were wrong.

This has been fixed and the JP2 metadata is now parsed to give the correct end times.















They will all need to be re-ingested for the new information to get into the database

science (5)

| <input type="checkbox"/> | Item Id | | | Level | Descriptor | Begin Time |
|--------------------------|--|---|---|-------|--------------------------|---------------------|
| <input type="checkbox"/> | solo_L3_eui-fsi174-image-occult_20200513T150204241 |  |  | L3 | eui-fsi174-image-occult_ | 2020-05-13T15:02:04 |
| <input type="checkbox"/> | solo_L2_eui-fsi174-image-occult_20200513T150204241  |  |  | L2 | EUI-FSI174-IMAGE-OCCULT_ | 2020-05-13T15:02:04 |
| <input type="checkbox"/> | solo_L1_eui-fsi174-image-occult_20200513T150204241  |  |  | L1 | EUI-FSI174-IMAGE-OCCULT_ | 2020-05-13T15:02:04 |
| <input type="checkbox"/> | solo_L2_eui-fsi174-image_20200513T150204241  |  |  | L2 | EUI-FSI174-IMAGE | 2020-05-13T15:02:04 |
| <input type="checkbox"/> | solo_L1_eui-fsi174-image_20200513T150204241  |  |  | L1 | EUI-FSI174-IMAGE | 2020-05-13T15:02:04 |

The descriptors were provided in a mixture of upper case and lower case.















science (5)

| <input type="checkbox"/> | Item Id | | | Level | Descriptor | Begin Time |
|--------------------------|--|---|---|-------|---------------------------|----------------------|
| <input type="checkbox"/> | solo_L3_eui-fsi174-image-occultar_20200513T150204241 |  |  | L3 | eui-fsi174-image-occultar | 2020-05-13T15:00:00Z |
| <input type="checkbox"/> | solo_L2_eui-fsi174-image-occultar_20200513T150204241  |  |  | L2 | eui-fsi174-image-occultar | 2020-05-13T15:00:00Z |
| <input type="checkbox"/> | solo_L1_eui-fsi174-image-occultar_20200513T150204241  |  |  | L1 | eui-fsi174-image-occultar | 2020-05-13T15:00:00Z |
| <input type="checkbox"/> | solo_L2_eui-fsi174-image_20200513T150204241  |  |  | L2 | eui-fsi174-image | 2020-05-13T15:00:00Z |
| <input type="checkbox"/> | solo_L1_eui-fsi174-image_20200513T150204241  |  |  | L1 | eui-fsi174-image | 2020-05-13T15:00:00Z |

The descriptors were provided in a mixture of upper case and lower case.

This has been corrected so that they are all provided in lower case.

science (5)

| <input type="checkbox"/> | Item Id | | | Level | Descriptor | Begin Time |
|--------------------------|--|---|---|-------|-------------------------|-----------------|
| <input type="checkbox"/> | solo_L3_eui-fsi174-image-occult_20200513T150204241 |  |  | L3 | eui-fsi174-image-occult | 2020-05-13T15:0 |
| <input type="checkbox"/> | solo_L2_eui-fsi174-image-occult_20200513T150204241  |  |  | L2 | eui-fsi174-image-occult | 2020-05-13T15:0 |
| <input type="checkbox"/> | solo_L1_eui-fsi174-image-occult_20200513T150204241  |  |  | L1 | eui-fsi174-image-occult | |
| <input type="checkbox"/> | solo_L2_eui-fsi174-image_20200513T150204241  |  |  | L2 | eui-fsi174-image | |
| <input type="checkbox"/> | solo_L1_eui-fsi174-image_20200513T150204241  |  |  | L1 | eui-fsi174-image | |

The descriptors were provided in a mixture of upper case and lower case.

This has been corrected so that they are all provided in

SWA-EAS filenames we've agreed with SWA to change:

Logical Source and number of files

- solo_L1_swa-eas-OnbPartMoms_ 83
- solo_L1_swa-eas1-NM3D_ 1932
- solo_L1_swa-eas1-SSc_ 634
- solo_L1_swa-eas2-NM3D_ 1866
- solo_L1_swa-eas2-SSc_ 654 -> 654

plus the Metadata Standard will be updated.

Clarifications of sections making up the file naming convention, use of the BLANK keyword, acceptable ISTP keyword values (CDF)

Now optional: TARGET, TDIMn for BINTABLE extension

Notes added to explain the structure of the OBT (FITS) and SCET (CDF) as coarse.fine

Section added for compressed FITS

Minor changes including language about being a proposal: in this mature state it provides **requirements**

Section 3.1.1.8 on light-time correction?


- HTTP_LINK was mandatory for CDFs, but recommended to be “The URL for the PI or Co-I web site holding online data.”
- SWA-HIS only host on SOAR, but do have usage notes.

EPD: <https://doi.org/10.5270/esa-5897yve>
EUI: <https://doi.org/10.5270/esa-l169c5q>
MAG: <https://doi.org/10.5270/esa-ux7y320>
Metis: <https://doi.org/10.5270/esa-366ut35>
SPICE: <https://doi.org/10.5270/esa-lbmdy7c>
SWA: <https://doi.org/10.5270/esa-ahypgn6>

Six instrument already have DOIs, list at <https://www.cosmos.esa.int/web/esdc/doi/solarorbiter>, for those who responded to the call from Arnaud Masson in March 2021

For SWA-HIS, proposed to add support data link and description to SWA DOI landing page (which can be updated), and include the SWA DOI in the TEXT field of the files with a short explanation.

Dataset provided by the European Space Agency



| | |
|-------------|--|
| Name | SWA, Solar Wind Analyser suite |
| Mission | Solar Orbiter |
| URL | http://soar.esac.esa.int/ |
| DOI | https://doi.org/10.5270/esa-ahypgn6 |
| Abstract | The Solar Orbiter Solar Wind Analyser (SWA) suite has been designed and created, and is operated by a large international consortium of institutes, which is led by UCL/Mullard Space Science Laboratory, UK, INAF-Istituto di Astrofisica e Planetologia Spaziali, Italy, Southwest Research Institute, USA and the Institut de Recherche en Astrophysique et Planétologie, France. These activities have been funded through numerous contracts from the UK Space Agency (UKSA), the UK Science and Technology Facilities Council (STFC), the Agenzia Spaziale Italiana (ASI), the Centre National d'Etudes Spatiales (CNES, France), the Centre National de la Recherche Scientifique (CNRS, France), the Czech contribution to the ESA PRODEX programme, and NASA. The SWA suite comprises 3 scientific sensors, the Electron Analyser System (SWA-EAS), the Proton-Alpha Sensor (SWA-PAS), and the Heavy Ion Sensor (SWA-HIS), which together are serviced by a central control and data processing unit (SWA-DPU). Together these sensors measure and categorise the vast majority of thermal and suprathermal ions and electrons in the solar wind and determine the abundances and charge states of the heavy ion populations. The SWA-EAS uses two top hat electrostatic analyser heads, each of which have 360° azimuth acceptance angles and ±45° aperture deflection plates. Together these two sensors, which are mounted on the end of the boom, cover a full sky field-of-view (FoV) (except for blockages by the spacecraft and its appendages) and measure the full 3D velocity distribution function (VDF) of solar wind electrons in the energy range of a few eV to ~5 keV. The SWA-PAS instrument also uses an electrostatic analyser with a more confined FoV (~24° x ~42° x ~22.5° around the expected solar wind arrival direction), which nevertheless is capable of measuring the full 3D VDF of the protons and alpha particles arriving at the instrument in the energy range from 200 eV/e to 20 keV/e. Finally, SWA-HIS measures the composition and 3D VDFs of heavy ions in the bulk solar wind as well as those of the major constituents in the suprathermal energy range and those of pick-up ions. Measurements are over a FoV of ~33° x ~66° x ~20° around the expected solar wind arrival direction and at energies up to 80 keV/e. The mass resolution (m/Δm) is > 5. |
| Description | SWA scientific data products from SWA-EAS and SWA-PAS consist of calibrated 3D velocity distribution functions (VDFs) of the major solar wind constituents: electrons, protons, and alpha particles. The basic moments of the distributions of these particles, such as density, velocity, pressure tensor, and heat flux vector are provided. The cadence (time resolution) of the data products varies between sensors and is anyway dependent on which of a number of normal or burst modes of operation the individual sensors are commanded into at any given time. Data products may be available at cadences between fractions of a second and 100 seconds, a range which supports characterisation of the fluid and kinetic states of the solar wind. In addition, using SWA-HIS measurements, derivations of relative elemental abundances, ionic charge state ratios and distributions, velocity space distributions and moments (population density, bulk flow speed and temperature) of representative high-FIP elements (the C, N, O group), and of low-FIP elements (such as Fe, Si or Mg) are provided. SWA-HIS full 3D VDFs of the prominent heavy ions are returned at 5 min cadence in normal mode and 30 s in burst mode. Additionally, SWA-HIS measures 3D VDFs of alpha particles at a 4 s resolution in burst mode. |

STIX Re-requests

Some STIX observations have been re-requested from the spacecraft to adjust the resolution (spectral & temporal) with respect to the originally downlinked file. These re-requests are therefore different versions of already existing products, and so are given an additional '-sup1' or '-sup2' to the descriptor. The original files and reasons for the re-request are given in this CSV file: [supplement_report_20230517.csv](#)

PHI Data Release Information

DPDD: [SOL-PHI-MPS-SW7400-IF-2_0_1.pdf](#)
[SO_PHI-HRT second data release.pdf](#)

These are all given on the Cosmos SOAR Help Guide pages, along with the TAP help, Jupyter Notebooks and SOOP information:

<https://www.cosmos.esa.int/web/soar/home>

If a SOOP isn't specified, intervals are listed in Help Pages: <https://www.cosmos.esa.int/web/soar/soops>

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https://www.cosmos.esa.int/web/soar/home

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solar orbiter archive

Home SOAR Web Guide Guide to using TAP Support Data SAMP Self Registration **SOOPs**

SOLAR ORBITER ARCHIVE (SOAR) HELP PAGES

These pages contains guides to using the SOAR

- Help on using the web interface to search
- Instructions on using TAP (Table Access Protocol) or scripted requests, which allows m
- Using SAMP to stream data directly to vi

HOME

HELP

SOAR USAGE HELP

User guide for the SOAR archive including:

- Support information for the contact us at: Solar
- Teams
- Guide to searching and access (Protocol)
- Information on using SAMP applications
- Register for a SOAR account

If you have any questions related at: Solar Orbiter Archive help desl

SOOPs - Solar Orbiter Archive x

https://www.cosmos.esa.int/web/soar/soops

Show / Hide Show all Export

Search:

| LTP | START DATE | END DATE | SOOP NAME | SOOP TYPE | SOOP INSTANCE ID |
|-----|----------------------|----------------------|--------------------------|-----------|------------------|
| 1 | 2020-06-14T17:55:18Z | 2020-06-22T00:00:00Z | I_DEFAULT | IDF | 111 |
| 1 | 2020-06-15T07:41:31Z | 2020-06-17T00:00:00Z | COORD_CALIBRATION | CC1 | 112 |
| 1 | 2020-06-18T04:00:00Z | 2020-06-18T05:00:00Z | COORD_CALIBRATION | CC1 | 113 |
| 1 | 2020-06-20T00:05:00Z | 2020-06-20T08:45:00Z | COORD_CALIBRATION | CC1 | 111 |
| 1 | 2020-06-21T15:35:00Z | 2020-06-21T21:02:00Z | COORD_CALIBRATION | CC1 | 114 |
| 1 | 2020-06-22T00:00:00Z | 2020-06-29T00:00:00Z | I_DEFAULT | IDF | 112 |
| 2 | 2020-06-29T00:00:00Z | 2020-08-03T00:00:00Z | I_DEFAULT | IDF | 112 |
| 2 | 2020-08-03T00:00:00Z | 2020-09-07T00:00:00Z | I_DEFAULT | IDF | 113 |
| 2 | 2020-09-14T00:00:00Z | 2020-10-19T00:00:00Z | I_DEFAULT | IDF | 114 |
| 2 | 2020-10-19T00:00:00Z | 2021-01-01T00:00:00Z | I_DEFAULT | IDF | 115 |
| 3 | 2021-02-21T06:00:00Z | 2021-02-21T07:00:00Z | CC_OFFPOI_FLATFIELD_FULL | CC3 | 111 |
| 3 | 2021-02-23T00:00:00Z | 2021-02-23T07:20:00Z | CC_ROLLS_RS | CC7 | 111 |
| 3 | 2021-03-24T20:00:00Z | 2021-03-29T09:00:00Z | CC_OFFPOI_STAR | CC6 | 112 |
| 3 | 2021-03-26T20:29:53Z | 2021-03-27T11:33:37Z | CC_OFFPOI_STAR | CC6 | 111 |
| 3 | 2021-04- | 2021-04- | COORD_CALIBRATION | CC1 | 111 |

If a SOOP isn't specified, intervals are listed in Help Pages: <https://www.cosmos.esa.int/web/soar/soops>

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https://www.cosmos.esa.int/web/soar/home

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Home SOAR Web Guide

SOAR USAGE

User guide for including:

- Support teams
- Guide to Protocol
- Information on using SAMP applications
- Register for a SOAR account

If you have any questions related at: [Solar Orbiter Archive help desk](#)

| | | | | | |
|----|----------------------|----------------------|--|-----|-----|
| 11 | 2023-06-21T15:00:00Z | 2023-06-21T18:00:00Z | L_FULL_LRES_MCAD_Probe-Quadrature | LF6 | 112 |
| 4 | 2021-09-13T00:00:00Z | 2021-09-27T00:00:00Z | L_SMALL_HRES_HCAD_Slow-Wind-Connection | LS2 | 111 |
| 6 | 2022-03-03T06:00:00Z | 2022-03-06T18:30:00Z | L_SMALL_HRES_HCAD_Slow-Wind-Connection | LS2 | 111 |
| 6 | 2022-03-17T06:00:00Z | 2022-03-22T00:00:00Z | L_SMALL_HRES_HCAD_Slow-Wind-Connection | LS2 | 112 |
| 11 | 2023-03-30T00:00:00Z | 2023-04-04T00:00:00Z | L_SMALL_HRES_HCAD_Slow-Wind-Connection | LS2 | 111 |
| 11 | 2023-04-21T06:45:00Z | 2023-04-25T23:05:00Z | L_SMALL_HRES_HCAD_Slow-Wind-Connection | LS2 | 112 |
| 6 | 2022-03-01T18:00:00Z | 2022-03-03T03:21:52Z | L_SMALL_MRES_MCAD_Connection-Mosaic | LS4 | 111 |

Search:

SOOP TYPE SOOP INSTANCE ID

| | |
|-----|--|
| IDF | 111 |
| CC1 | 112 |
| CC1 | 113 |
| CC1 | 111 |
| CC1 | 114 |
| IDF | 112 |
| IDF | 112 |
| IDF | 113 |
| IDF | 114 |
| IDF | 115 |
| 3 | 2021-02-21T06:00:00Z 2021-02-21T07:00:00Z CC_OFFPOI_FLATFIELD_FULL CC3 111 |
| 3 | 2021-02-23T00:00:00Z 2021-02-23T07:20:00Z CC_ROLLS_RS CC7 111 |
| 3 | 2021-03-24T20:00:00Z 2021-03-29T09:00:00Z CC_OFFPOI_STAR CC6 112 |
| 3 | 2021-03-26T20:29:53Z 2021-03-27T11:33:37Z CC_OFFPOI_STAR CC6 111 |
| 3 | 2021-04- COORD_CALIBRATION CC1 111 |

To find out how much data (in bytes) would be included in a download of all files from the SOOP named 'CC_OFFPOI_FLATFIELD_HRI', this is another metadata search using SUM:
`http://soar.esac.esa.int/soar-si-tap/tap/sync?REQUEST=deQuery&LANG=ADQL&FORMAT=CSV&QUERY=SELECT+SUM+(filesize)+FROM+v_sc_repository_file+WHERE+soop_name+LIKE+'%25CC_OFFPOI_FLATFIELD_HRI%25'`

To download all files where the SOOP field contains the SOOP name 'CC_OFFPOI_FLATFIELD_HRI', this is a data request (which has a different beginning), where the targets of the query are filepath and filename:
`http://soar.esac.esa.int/soar-si-tap/data?retrieval_type=PRODUCT&QUERY=SELECT+filepath,filename+FROM+v_sc_repository_file+WHERE+soop_name+LIKE+'%25CC_OFFPOI_FLATFIELD_HRI%25'`

Insert the name of the SOOP that you want, WITH the characters either end '%25<SOOPname>%25'

This will get you all of the versions associated with this SOOP. Work to provide the syntax for downloading only the latest versions is ongoing but will be available very shortly.

All fine except where not associated:

- “
- unknown_soop
- not defined
- None
- **none**

Has soap_type but no soap_name: 42884

Has soap_name but no soap_type: 0

Has neither soap_type or soap_name: 397650

Has both soap_type and soap_name: 835167

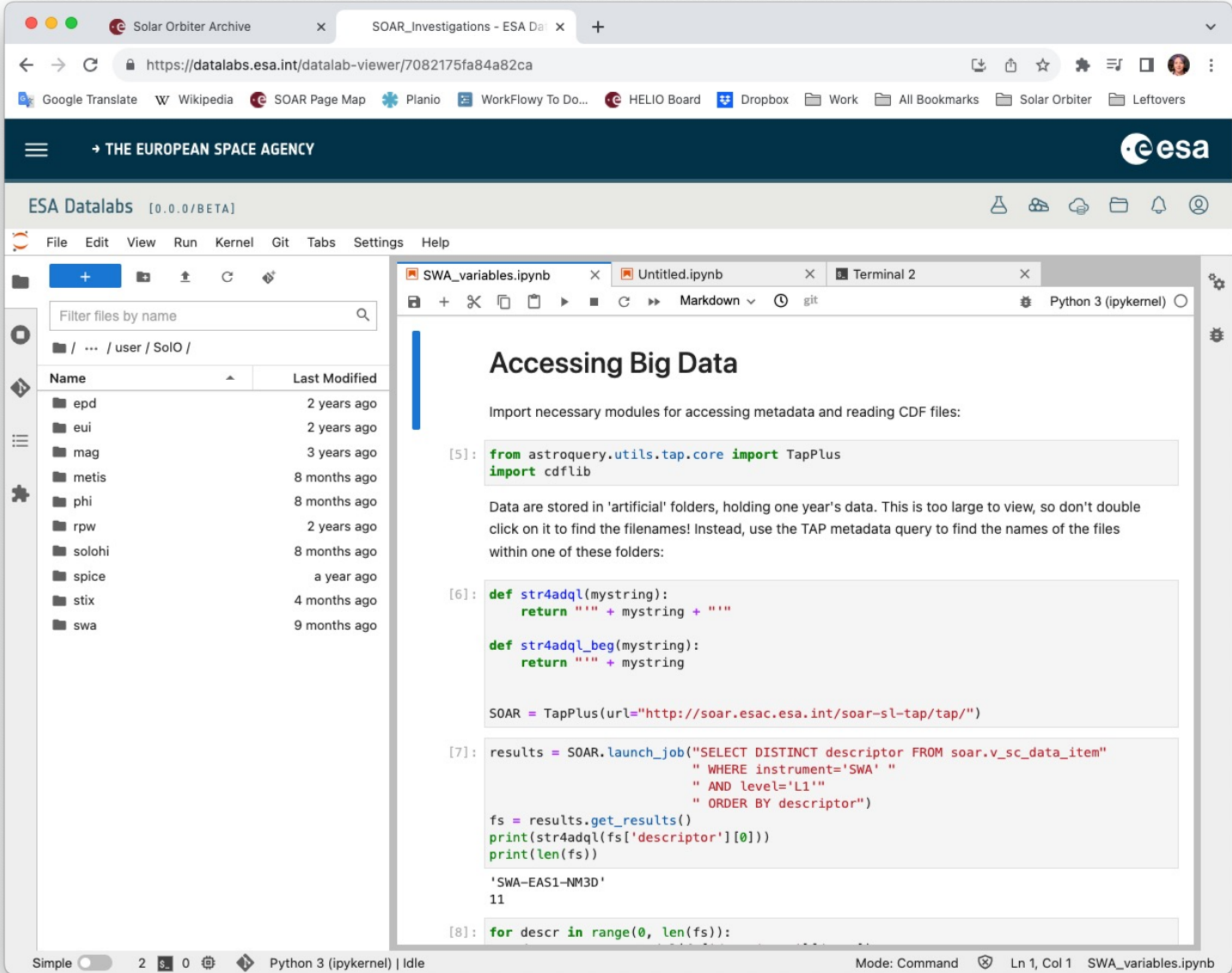
SOOPs that were run with no mention in any metadata – maybe not received that data yet

LTP 6, 2022-01-20T00:00:00Z/2022-02-03T03:15:00Z, R_FULL_LRES_HCAD_Full-Disk-Helioseismology

LTP 11, 2023-04-05T09:00:00Z/2023-04-05T16:58:49Z, L_BOTH_HRES_HCAD_Major-Flare

- EUI done
- ICD sent out to all teams
- Responses from SPICE and PHI
- SPICE has already done the required changes, so will be able to connect them this summer
- Other teams can be added in the autumn when more interaction is easier

Datalabs provides Docker applications, including Jupyter Notebooks, alongside the entire SOAR, locally mounted for direct, complete and fast access to all archived data.



TAP help and Jupyter Notebooks

Support Data - Solar Orbiter Archive

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ARCHIVE SUPPORT DATA

This page contains relevant information for the understanding of the Solar Orbiter (SOAR) Archive (SOAR) at <http://soar.esac.esa.int/soar/>. Further information and user interface can be found at <https://www.cosmos.esa.int/web/soar/home>.

This is a copy of the page at Archive Support Data which contains information about the data files. The instruments may also provide calibration files.

IN SITU: EPD | MAG | RPW | SWA

REMOTE SENSING: EUVI | Metis | PHI | Solo

EPD - ENERGETIC PARTICLE DETECTOR

DPDD: SO-EPD-PO-TN-0038_iss1_rev2_DPDD.pdf

Calibration Files:

- solo_CAL_epd-epthet1-burst1_20200512_V02.cdf
- solo_CAL_epd-epthet1-burst2_20200512_V02.cdf
- solo_CAL_epd-epthet1-burst3_20200512_V02.cdf
- solo_CAL_epd-epthet1-nom_20200512_V02.cdf
- solo_CAL_epd-epthet1-quicklook_20200512_V02.cdf
- solo_CAL_epd-epthet2-burst1_20200512_V02.cdf
- solo_CAL_epd-epthet2-burst2_20200512_V02.cdf
- solo_CAL_epd-epthet2-burst3_20200512_V02.cdf
- solo_CAL_epd-epthet2-nom_20200512_V02.cdf
- solo_CAL_epd-epthet2-quicklook_20200512_V02.cdf
- solo_CAL_epd-sis-a-rates_20200401_V04.cdf
- solo_CAL_epd-sis-b-rates_20200401_V04.cdf
- solo_CAL_epd-step-burst1_20200429_V01.cdf
- solo_CAL_epd-step-nom_20200429_V01.cdf
- solo_CAL_epd-step-quicklook_20200429_V01.cdf

EUVI - EXTREME UV IMAGER

Home page: <https://sidc.be/EUVI/intro>

SearchByDistance_Intervals

FileEditViewInsertCellKernelWidgetsHelp

RunMarkDown

Searching by distance from Sun

Import the CDF library and open the orbit file:

```
In [18]: 1 import cdf
2 import matplotlib.pyplot as plt
3 import pandas as pd
4 import numpy as np
5 import datetime as dt
6
7 today = dt.datetime.now()
8 print(today, type(today))
9
10 AU = 149597870.700 #km
11
12 fileAndPath = ('/Users/hmidleton/Desktop/solo_Anc_soc-orbit_20200210')
13 cdf_file = cdf.CDF(fileAndPath)
14
15 2023-06-21 17:29:03.968660 <class 'datetime.datetime'>
```

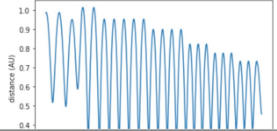
```
In [6]: 1 # Read in all the metadata:
2 info_dict = cdf.file.cdf_info()
3 zvars = info_dict['zvars']
4 print('All zvars: ', zvars, '\n')
5 print('zvar, FIELDNAM, CATDESC \n')
6
7 for z in zvars:
8     y = cdf.file.varrattaget(z)
9     print(z, y['FIELDNAM'], y['CATDESC'])
```

All zvars: ['EPOCH', 'HCI_POS', 'HCI_VEL', 'HEE_POS', 'HCENTRIC_DIST', 'HURST_LON', 'LABL_HCI_POS', 'REP_HCI_POS', 'LABL_HCI_VEL', 'REP_HCI_VEL', 'zVar, FIELDNAM, CATDESC

EPOCH Time Interval Centred Timetags
HCI_POS HCI Position Spacecraft Position in Heliocentric Inertial Coordinates
HCI_VEL HCI Velocity Spacecraft Position in Heliocentric Inertial Coordinates
HEE_POS HEE Position Spacecraft Position in Heliocentric Earth Ecliptic Coordinates
HCENTRIC_DIST Heliocentric Distance Spacecraft Heliocentric Distance
HGRAP_LAT Heliographic Latitude Spacecraft Heliographic Latitude
ECLIP_LAT Ecliptic Latitude Spacecraft Ecliptic Latitude
HCI_LON HCI Longitude Spacecraft Heliocentric Inertial Longitude
SHURST_LON Stonyhurst Longitude Spacecraft Stonyhurst Longitude
LABL_HCI_POS HCI POS Axis Label Axis Label for Spacecraft HCI Position
REP_HCI_POS HCI POS Representation Vector Representation for Spacecraft HCI Position
LABL_HCI_VEL HCI VEL Axis Label Axis Label for Spacecraft HCI Velocity
REP_HCI_VEL HCI VEL Representation Vector Representation for Spacecraft HCI Velocity
LABL_HEE_POS HEE POS Axis Label Axis Label for Spacecraft HEE Position
REP_HEE_POS HEE POS Representation Vector Representation for Spacecraft HEE Position

Note that the CATDESC for HCI_VEL is position and not velocity - tell Andrew

```
In [7]: 1 t = cdf.file.varrattaget("EPOCH")
2 # CDF_TIME_TT2000 (TT2000 as short) is nanoseconds since J2000 with 1e9
3 d = cdf.file.varrattaget("HCENTRIC_DIST")
4
5 fig, ax = plt.subplots()
6 ax.plot(cdf.file.cdfepoch.to_datetime(t), d/AU)
7 ax.set_ylabel('distance (AU)')
8 plt.show()
```



DailyDigestByInstrumentAndLevel

FileEditViewInsertCellKernelWidgetsHelp


RunCode

Daily Digest by Instrument and Level

This script should tell me more details about the files recently delivered.

I want to set up a nested loop that goes through each instrument and processing level and returns just the number of those files that have been ingested since default: yesterday, but can be whatever, e.g., last time I know they sent anything.

```
In [1]: 1 from astroquery.utils.tap.core import TapPlus
2 from datetime import datetime, timedelta
3
4
5 def str4adql(string):
6     return '*' + string + '*'
7
8
9 def TAP_PlusReq(ADQL):
10     SOAR = TapPlus(url=src_str)
11     results = SOAR.launch_job(ADQL)
12     table = results.get_results()
13     return table
14
15
16 src_str = 'http://soar.esac.esa.int/soar-sl-tap/tap/'
17 instr_list = ['EPD', 'EUVI', 'MAG', 'METIS', 'PHI', 'RPW', 'SOLOHI', 'SPICE', 'STIX', 'SWA']
18 #instr_list = ['PHI']
19 level_list = ['L01', 'L02', 'L0', 'L1', 'L2', 'L3']
20
21 # Use a number of days ago
22 days_to_subtract = 1 # for yesterday at midnight
23 dt_yesterday = datetime.today() - timedelta(days=days_to_subtract)
24 iso_yesterday = str4adql(dt_yesterday.strftime('%Y-%m-%dT%H:%M:%S') + '+00:00:00')
25
26 # Or put in a custom date and time
27 iso_yesterday = str4adql('2023-07-03T00:00:00')
28 print(iso_yesterday)
29
30 for instr in instr_list:
31     for level in level_list:
32         instr_str = str4adql(instr)
33         level_str = str4adql(level)
34         table = 'v_je_data_item'
35         if 'LL' in level: table = 'v_l1_data_item'
36
37         ADQL = ("SELECT COUNT (data_item_id) "
38               "FROM " + table + " "
39               "WHERE instrument='"+instr_str+" "
40               "AND level='"+level_str+" "
41               "AND insertion_time>"+iso_yesterday+" ")
42
43         table = TAP_PlusReq(ADQL)
44         if table['count'][0][0] != 0:
45             print(instr, level, table['count'][0][0])
46
47 '2023-07-03T00:00:00'
48 EPD L02 110
49 PHI L2 3670
50 RPW L02 18
51 STIX L0 479
52 STIX L1 479
53 SWA L02 32
54 SWA L1 354
55 SWA L2 920
```



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- Helen Middleton
- I am 50% SOAR (along with 50% Cluster Science Archive), but if you have any doubts, questions, comments or requests for assistance, do not hesitate to contact me:
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