# ESA SPACE WEATHER NETWORK SERVICE PRODUCT CATALOGUE SUMMARY


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| Prepared by | SSCC Team |
| | BIRA-IASB |



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# APPROVAL

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# CHANGE LOG

| Reason for change | Issue Nr | Revision Number | Date |
|---|---|---|---|
| **Initial release added in SWE Portal 2.2.0:** http://swe.ssa.esa.int/release-notes-2.2.0 | 1 | 1 | 13 Sep 2016 |
| **Updated for SWE Portal 2.3.0:** http://swe.ssa.esa.int/release-notes-2.3.0 | 2 | 1 | 20 Oct 2016 |
| **Update for SWE Portal 2.5.0:** http://swe.ssa.esa.int/release-notes-2.5.0 | 3 | 1 | 09 Feb 2017 |
| **Update for SWE Portal 2.6.0:** http://swe.ssa.esa.int/release-notes-2.6.0 | 4 | 1 | 28 Apr 2017 |
| **Update for SWE Portal 2.7.0:** http://swe.ssa.esa.int/release-notes-2.7.0<br><br>*Addition of the following products: R.136*<br><br>*Modification of the following products: R.130, H.115a, S.101, S.107c* | 5 | 1 | 05 Sep 2017 |
| **Update for SWE Portal 2.8.0:** http://swe.ssa.esa.int/release-notes-2.8.0<br><br>*Addition of the following products: G.126, G.127, G.128, G.129, G.130, G.131, G.132, G.133, H.103c, R.102, R.108, R.123, R.124, R.125, R.127* | 6 | 1 | 16 Jan 2018 |
| **Update for SWE Portal 2.9.0:** http://swe.ssa.esa.int/release-notes-2.9.0<br><br>*Addition of the following products: G.134, G.135, S.123b, I.133, I.132a, I.132b, I.132c*<br><br>*Modification of the following group of products: SIDC, IRF* | 7 | 1 | 22 May 2018 |
| **Update for SWE Portal 2.10.0:** http://swe.ssa.esa.int/release-notes-2.10.0 | 8 | 1 | 27 Sep 2018 |

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|---|---|---|---|
| *Addition of the following products: H.110b, H.101e, H.108b, I.123a, I.123b, I.123c, I.123d, I.123e*<br><br>*Modification of the following products: H.101a, H.102a, H.103a, H105a, H106a, H.107a, H.108a, H.110a and H113a, R.130 and R.109-R.117 (group), I.121* | | | |
| **Update for SWE Portal 2.11.0:**<br>http://swe.ssa.esa.int/release-notes-2.11.0<br><br>*Addition of the following products: R.135, R.142-R.157, S.107f, S.123c, S.109c, I.101b, I.134(a,b), I.137, I.138*<br><br>*Modification of the following products: R.128-R.130* | 9 | 1 | 07 Jan 2019 |
| **Update for SWE Portal 2.12.0:**<br>http://swe.ssa.esa.int/release-notes-2.12.0<br><br>*Addition of the following products: R.133, R.138, H.200a, H.101g, H107c_Mercury, H107c_Venus and H107c_Mars, H.101f, H.107b, S.105d, S.109e, S.108b, S126, I.135a, I.135b, I.136a*<br><br>*Modification of the following products: R.131, R.132, R.109, R.110, R.111, R.112, R.113, R.114, R.115, R.116, R.117, S.124, I.123a, I.123b, I.123c, I.123d, I.123e* | 10 | 1 | 28 May 2019 |
| **Update for SWE Portal 2.12.1:**<br><br>*Addition of the following products:* I.137, I.138<br><br>**Update for SWE Portal 2.13.0:**<br>http://swe.ssa.esa.int/release-notes-2.13.0<br><br>*Addition of the following products* H.111a, H.111b, R.139, R.140, R.141, R.137, I.139<br><br>*Modification of the following products:* R.109, R.110, R.111, R.112, R.113, R.114, R.115, R.116, R.117, S.105c<br><br>*Change of ownership:* G.103, G.104, G.118, G.119, G.120, G.121, G.122 | 11 | 0 | 25 Feb 2020 |
| **Update for Portal 3.1.0:**<br>http://swe.ssa.esa.int/release-notes-3.1.0<br><br>*Addition/Transfer of the following products: G.101, G.102, G.136, G.137a-e, G.138, G.139, G.140, G.141, G.142, G.143, G.144, H.120a, H.120b, H.121a, H.121b, H.121c, S.107g*<br><br>*Modification of the following products: R.107, R.129, R.130, R.139, R.140, H.106b, H.110b, H.101f* | 12 | 0 | 01 Oct 2020 |
| **Update for Portal 3.2.0:**<br>https://swe.ssa.esa.int/release-notes-3.2.0<br><br>*Addition/Transfer of the following products: I.140*<br><br>*Modification of the following products: S.121, S.122, R.107, G.101* | 13 | 0 | 23 Nov 2020 |
| **Update for Portal 3.3.0:**<br>https://swe.ssa.esa.int/release-notes-3.3.0<br><br>*Modification of the following products: G.144, G.145, G.146, G.147, G.148, G.149, G.150, G.151, G.153a-c, G.154a-c, G.155, G.156,* | 14 | 0 | 07 Oct 2021 |

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| *G.157, G.158, G.159, G.160, G.161, G.163, G.164, G.165, G.166, H.101h, H.120c, H.121d, R.101, R.158, R.159, R.160, R.161, R.162, R.163*<br><br>*Modification of the following products: G.101, G.102, G.136, G.137a-e, G.138, G.139, G.140, G.141, G.142, G.143, I. 116, I.118, I.120, I.135a-b, S.101c, H106b, H.108b, R.102, R.128, R.129, R.138, R.142, R.143, R.144, R.145, R.149, R.150, R.151, R.152, R.153, R.154, R.155, R.156, R.157* | | | |
| **Update for Portal 3.4.0:**<br>https://swe.ssa.esa.int/release-notes-3.4.0<br><br>*Addition/Transfer of the following products: H.101z, S.050a, S.051a, S.052a*<br><br>*Modification of the following products: H.103b, G.101, G.153, G154, R.130, R.158, R.159, R.163, S.105a, S.105c* | 15 | 0 | 07 Apr 2022 |
| **Update for Portal 3.5.0:**<br>https://swe.ssa.esa.int/release-notes-3.5.0<br><br>*Addition/Transfer of the following products: I.138 I.141*<br><br>*Modification of the following products: R.123, R.124, R.125, R.128, G.123, G.148, G.149, G.150, G.151, G.166, I.121, I.128, S.107f, H.200a* | 16 | 0 | 06 Oct 2022 |
| **Update for Portal 3.6.0:**<br>https://swe.ssa.esa.int/release-notes-3.6.0<br><br>*Addition of the following products: H.109a, S.127*<br><br>*Modification of the following products: H.101b, H.108b, H.115a, G.102, G.140, R.130* | 17 | 0 | 09 Mar 2023 |
| **Update for Portal 3.7.0:**<br>https://swe.ssa.esa.int/release-notes-3.7.0<br><br>*Addition of the following products: I.106, I.142, I.143, I.144, I.145, I.146, I.147, I.148, I.149, I.150, I.151, I.152, I.153, I.154, I.155, I.156, I.157, I.158, I.159, I.160, I.161, I.162, S.005a, S.017a, S.019a, S.107h, S.123d, S.501a, S.790a, S.801a, G.167, G.168, G.169, G.170, R.165, R.166, R.167, R.168, R.170, R.171, R.172, R.173, R.174, R.175, R.176, R.177, R.178, R.179, R.180, R.201, R.211, R.212, R.213, R.214, R.215, R.216, R.217, R.218, R.219, H.101i, H.103d, H.109b*<br><br>*Modification of the following products: H.101z, H.112a, H.113a, I.102, I.104, I.134c, G.156, R.102*<br><br>*Updates on DTU and BGS products' download button: G.161, G.136, G.137a, G.137b, G.137c, G.137d, G.137e, G.138, G.139, G.140, G.141, G.142, G.143, G.148, G.149, G.151, G.163, G.164, G.165*<br><br>*Removal of the following products: I.106a, I.106b, I.106c, I.106d, I.106e, I.127, I.136, I.101, I.103a, H.103b, H.111a, H.111b.* | 18 | 0 | 11 Jul 2023 |
| **Update for Portal 3.8.0:**<br>https://swe.ssa.esa.int/release-notes-3.8.0<br><br>*Addition of the following products: S.508b, H.103e, G.171*<br><br>*Modification of the following product: I.139, H.101e* | 19 | 0 | 05 Oct 2023 |

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|---|---|---|---|
| **Update for Portal 3.9.0:**<br>https://swe.ssa.esa.int/release-notes-3.9.0<br><br>*Addition of the following products: G.172, G.173, G.174, G.175, G.176, R.221, R.222, R.223, R.224, R.225, R.226, S.042a, S.600z*<br><br>*Modification of the following product: I.121, I.139, R.101, S.101c* | 20 | 0 | 14 Mar 2024 |
| **Update for Portal 3.10.0:**<br>*https://swe.ssa.esa.int/release-notes-3.10.0*<br><br>*Modification of the following products: G.171, S.508b, I.102b, I.104b, I.135* | 21 | 0 | 13 Jun 2024 |
| **Update for Portal 3.11.0:**<br>*https://swe.ssa.esa.int/release-notes-3.11.0*<br><br>*Modification of the following products: S.124, S.005a, S.050a, S.051a, S.052a, I.110c, I.110d, ~~I.132~~* | 22 | 0 | 10 Oct 2024 |
| **Update for Portal 3.12.0:**<br>*https://swe.ssa.esa.int/release-notes-3.12.0*<br><br>*Modification of the following products: G.171, H.103e, H.109a, H.109b, H.101i, I.132, S.042a* | 23 | 0 | 20 Feb 2025 |
| **Update for Portal 3.13.0:**<br>*https://swe.ssa.esa.int/release-notes-3.13.0*<br><br>*Modification of the following products: G.107, G.108, G.109, G.110, H.103e, H.103d, H.109a, H.109b, H.101i, I.122c-m, I.128, I.129, I.130, I.131, I.142* | 24 | 0 | 03 Jul 2025 |
| **Update for Portal 3.14.0:**<br>*https://swe.ssa.esa.int/release-notes-3.14.0*<br><br>*Addition of the following products: I.163, I.164, I.165, I.166* | 25 | 0 | 14 Oct 2025 |
| **Update for Portal 3.15.0:**<br>*https://swe.ssa.esa.int/release-notes-3.15.0*<br><br>*Addition of the following products: G.177, G.178, G.179, G.180, G.181, G.182, G.183, G.184, I.169, I.170, I.171, I.172, I.173, I.174*<br><br>*Modification of the following products: G.101, G.136, G.137a-e, G138, G139, G.140, G.141, G142, G.143, G.148, G.149, G.150, G.151, G.155, G.156, G.163, G.164, G.165, G.166, G.167, G.168, I.105a-b, I.106, R.103, R.175* | 26 | 0 | 05 Mar 2026 |
| **Update for Portal 3.16.0:**<br>*https://swe.ssa.esa.int/release-notes-3.16.0*<br><br>*Addition of the following products: R.134a.*<br><br>*Modification of the following products: G.106, G.107, G.153a, G.154a, G.157, R.130, R.166, R.178, R.179, R.180, I.144, I.145, I.146, S.508b* | 27 | 0 | 23 Jun 2026 |
| **Update for Portal 3.17.0:**<br>*https://swe.ssa.esa.int/release-notes-3.17.0*<br><br>*Addition of the following products: G.185, R.231, R.232, R.233, R.234*<br><br>*Modification of the following products: G.113, G.134, G.135, G.145, S.107a-h, S.017a, S.019c, S.042a, S.123d, S.101, S.101c, S.102,* | 28 | 0 | 15 Oct 2026 |

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|---|---|---|---|
| *S.103, S.104, S.105a, S.105d, S.106, S.105c, S.108, S.111, S.126, S.127, S.108b, S.109a, S.109b, S.110, S.123b, S.600z, S.112a, S.112b, S.112z, S.113, S.790a, R.170, R.171, R.172, R.173, R.174, R.175, R.213, R.215, R.135, I.122c-g, I.122i-m, I.139, I.163, I.164*<br><br>*Removal of the following products: R.107, R.134* | | | |

# CHANGE RECORD

| Issue Number 28 | Revision Number 0 | | |
|---|---|---|---|
| Reason for change | Date | Pages | Paragraph(s) |
| New release 3.17.0 | 15 Oct 2026 | | |

# DISTRIBUTION

| Name/Organisational Unit |
|---|
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## Table of Contents

Purpose of this document ..... 9

1. Space weather products ..... 10

1.1. Solar weather products ..... 11

1.2. Heliospheric weather products ..... 33

1.3. Space radiation products ..... 54

1.4. Ionospheric weather products ..... 95

1.5. Geomagnetic conditions products ..... 131

Part 2: Expert Groups ..... 164

Expert group contribution per ESC ..... 164

Expert Group Details ..... 167

Part 3: Facilities supporting the network ..... 203

Facilities Details ..... 203

# PURPOSE OF THIS DOCUMENT

The purpose of this document is to list the Space Weather data products available through the ESA Space Weather Service Portal.

The ESA Space Weather Portal provides the main online entry point to the ESA Space Weather Service Network and consequently gives access to a range of space weather products and applications for the twelve SWE Service Domains (‘Spacecraft design’, ‘Spacecraft operation’, ‘Human spaceflight’, ‘Launch operation’, ‘Communication and Navigation’, ‘Space Traffic Coordination’, ‘Power System Operation’, ‘Aviation’, ‘Resource Exploration and Exploitation’, ‘Pipeline Operation’, ‘Aurora Observation and Forecast’, ‘General Data and Modelling Services’) and links all elements of the Space Weather Service Network, including the five Expert Service Centres.

In this document, details of each SWE data product currently available are presented as well as contact information of their provider. Note that this document does not list all Expert Groups participating in each of the Expert Centres with products in development. For this information, the reader is referred to the ESC pages available via the ESA SWE portal (https://swe.ssa.esa.int). Only groups actively providing products are listed in this document. The document will be updated following each new product deployment.

This document has been prepared by the ESA Space Weather Services Coordination Centre (SSCC).

Part 1 of this document lists the Space Weather data products available on the SWE Portal.

Part 2 describes the Expert Groups providing these products.

Part 3 describes the facilities supporting the network.

# 1. SPACE WEATHER PRODUCTS

The first part of this document presents the Space Weather federated products available through the ESA Space Weather Network.

The products are classified per Expert Service Centre (ESC). The different ESC's and contributing number of Expert Groups currently providing SWE data products are:

| | Number of Expert Groups | Number of SWE data products |
|---|---|---|
| Solar weather | 10 | 50 |
| Heliospheric weather | 8 | 46 |
| Space radiation | 15 | 94 |
| Ionospheric weather | 15 | 87 |
| Geomagnetic conditions | 13 | 80 |

Note: This table counts all product presented in the SWE Portal except for those marked as "coming soon".

The expert groups referred to here are only those which are currently providing products, and not an exhaustive list of all Expert Groups affiliated with each Expert Service Centre.

This chapter provides a detailed description of the products grouped by Expert Service Centre.

The details of each product provider are gathered in Part 2.

## 1.1. Solar weather products

### S.005a Synchronous synoptic maps of the photosphere

#### Description

Synchronous synoptic maps are maps of the solar photospheric magnetic field and continuum intensity on the full solar sphere, in heliographic (Carrington) longitude and latitude, where data are taken as close as possible to a reference time. These maps are built from SDO/HMI (NASA Solar Dynamics Observatory mission / Helioseismic and Magnetic Imager) data.

#### Status

Ready

#### Provider

Multi Experiment Data & Operation Center (MEDOC)

#### Portal Entry Point

https://swe.ssa.esa.int/medoc-S005a-federated

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### S.017a ASUCAS/SPS White light Solar images

#### Description

White light synoptic images are provided by ASUCAS/SPS each sunny day (7/7, holidays included). The images are acquired approximately every 60 minutes by a 150/750 mm telescope equipped with a 12 bit CMOS camera (4656×3520 px; 1.05"/px). Final images are stored as FITS files with 2200×2200 pixel size and also as preview images in jpg format.

#### Status

Ready

#### Provider

Solar Patrol Service (SPS)

#### Portal Entry Point

https://swe.ssa.esa.int/sps-S017a-federated

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### S.019a ASUCAS/SPS Halpha Solar images

#### Description

Halpha synoptic images are provided by Solar Patrol Service (SPS)/ASU CAS each sunny day (7/7, holidays included). The images are acquired approximately every 60 minutes by 150/750

mm telescope equipped with 12 bit CMOS camera (4656×3520 px; 1.05"/px). Final images are stored as FITS files at 2200×2200 pixel size and also preview jpg images are produced.

### Status

Ready

### Provider

Solar Patrol Service (SPS)

### Portal Entry Point

https://swe.ssa.esa.int/sps-S019a-federated

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## S.042a Solar Magnetic Activity Forecasting

### Description

The Solar Magnetic Activity Forecasting tool forecasts the level of solar activity in the near/mid-term future via a proxy of the sunspot number (SSN). In the current version the controlled forecasting horizon of the solar cycle 25 activity level provided by the tool is set to 3 years.

### Status

Ready

### Provider

Institut de recherche sur les lois fondamentales de l'Univers (IRFU)

### Portal Entry Point

https://swe.ssa.esa.int/irfu-federated

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## S.050a Synchronous synoptic maps of the solar corona in the UV and extreme-UV

### Description

This service provides maps of the radiance in different UV and extreme-UV (EUV) bands on the full solar sphere, in heliographic Carrington coordinates, for a given reference time. These maps are derived from SDO/AIA observations.

### Status

Ready

### Provider

Multi Experiment Data & Operation Center (MEDOC)

### Portal Entry Point

https://swe.ssa.esa.int/medoc-S050a-federated

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## S.051a Maps of the thermal structure of the solar corona

### Description

This service provides maps of parameters of a Differential Emission Measure (DEM) model as a function of temperature: temperature (T), Emission Measure (EM), width of the DEM, and goodness of fit ($\chi 2$). These maps are derived from SDO/AIA observations.

### Status

Ready

### Provider

Multi Experiment Data & Operation Center (MEDOC)

### Portal Entry Point

https://swe.ssa.esa.int/medoc-S051a-federated

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## S.052a Maps of electric currents in Active Region

### Description

This service provides maps of the radial component of the electric current density vector in Active Regions, in Cylindrical Equal Area coordinates. These maps are derived from science-level and near-real-time SDO/HMI data.

### Status

Ready

### Provider

Multi Experiment Data & Operation Center (MEDOC)

### Portal Entry Point

https://swe.ssa.esa.int/medoc-S052a-federated

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## S.101 Proba2/SWAP Images

### Description

The SWAP instrument onboard the Proba2 spacecraft provides full disc solar EUV images in the 174 Angstrom bandpass. The latest level 0 quicklook image is uncalibrated and meant to

monitor instrument status, while the media level image has undergone extensive calibration, image compression and enhancement processing to bring out the best of the image for Space weather forecasting operations.

### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-S101-federated

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## S.101c SIDC Solarmap

### Description

This service allows the user to display solar features (such as sunspot groups, coronal holes, filaments, flares, and coronal mass ejections) on the solar disc. The user can select features and navigate back and forth in time: the closest available observations and images will be displayed. A Heliocentric Earth equatorial (HEEQ) grid of 15 degrees can also be added to refine the feature location on the surface. Additional characteristics of the features (such as time of observation, coordinates of the specified locations, etc.) are also indicated. Additionally, the user can overplot specific locations of interest onto the solar disc. A viewpoint other than Earth can also be specified from a pre-defined list of planetary and spacecraft locations.

### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-S101c-federated

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## S.102 Proba2/LYRA Data

### Description

The LYRA instrument onboard the Proba2 spacecraft registers UV and EUV irradiance using 4 different filters. Calibrated level 2 and level 3 (1 minute averaged) data are available in daily FITS-files as well as level 4 calibrated daily PNG plots. The LYRA Rescaled data provide rescaled values from the Aluminium and Zirconium channels which have been cross-calibrated with GOES

X-ray data in order to provide a proxy for X-ray flare intensity. The rescaled data are available in daily TEXT files as well as daily PNG plots.

### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-S102-federated

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## S.103 SIDC/USET Halpha Solar images

### Description

Halpha solar images are produced by the SIDC local observing facilities (Uccle Solar Equatorial Table). The CCD camera is a Qimaging Retiga 4000R. It has an inter-line transfer detector of 2048x2048 pixels. Each pixel is 7.5 micron x 7.5 micron, and the sensitive area is 15.6 mm x 15.6 mm. The H-alpha filter is made by Solar Spectrum. It has a nominal wavelength of 656.2808nm and a bandwidth of 0.05nm. The telescope is a Celestron 80mm ED refractor. The images are provided in FITS files and quicklook PNGs.

### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-S103-federated

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## S.104 SIDC/USET White light Solar images

### Description

Solar white light images are produced by the SIDC local observing facilities (Uccle Solar Equatorial Table). The CCD camera is a Qimaging Retiga 4000R. It has an inter-line transfer detector of 2048x2048 pixels. Each pixel is 7.5 micron x 7.5 micron, and the sensitive area is 15.6 mm x 15.6 mm. The telescope is a Lichtenknecker 150mm diameter achromatic doublet refractor, equipped with full-aperture neutral-density filter with an attenuation of 100,000 (5 densities). The images are provided in FITS files and quicklook PNGs.

### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-S104-federated

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## S.105a SIDC Humain Callisto Solar radio spectrograms

### Description

This page provides access to the radio spectrograms from the Callisto instrument installed in Humain (Belgium). The spectrometer is plugged to a Sun-tracking broadband antenna and is operated automatically from Brussels. The spectrum covers the band 45 - 440 MHz with 200 samples (frequencies) 4 times per second. The empty "areas" on the spectrum correspond to parts in the spectrum that intentionally not covered to protect the instrument from high power emitters (e.g. FM band).

### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-S105a-federated

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## S.105b eCallisto Solar radio spectrograms

### Description

The e-Callisto Network provides solar radio spectrograms from observing stations spread around the globe. The data are used for the identification of radio bursts as indications of Solar phenomena driving Space Weather. The stations are all equipped with a CALLISTO spectrometer, which is a programmable heterodyne receiver originally built at ETH Zurich in the framework of IHY2007 and ISWI.

### Status

Ready

### Provider

Institute for Data Science (I4DS)

### Portal Entry Point

https://swe.ssa.esa.int/ecallisto-federated

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## S.105c SIDC Automated Solar radio burst detections

### Description

The radio spectrograms obtained by the Callisto instrument installed in Humain (Belgium) are processed by an automated burst detection algorithm that analyses for each individual spectrum (vertical line, in time) its brightness distribution. A burst is detected when the brightness distribution varies significantly in time. The bursts are annotated on the quicklook images. Currently, the algorithm may still trigger false alerts (e.g. fast antenna motion at end and start of observations, lightning due to thunderstorms, strong interferences).

### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-S105c-federated

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## S.105d SIDC/Humain Solar radio light curves

### Description

The Humain Solar Radio Spectrometer (HSRS) is a Software Defined Radio receiver which is plugged to a Sun-tracking broadband antenna in Humain (Belgium). The HSRS observations are rather unique radio observations in Europe that cover a large frequency range including the ones used by the air traffic controllers and some of the GNSS services. This product offers real-time information about the intensity of the Solar radio flux at those specific frequency bands.

### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-S105d-federated

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## S.106 SDO/AIA Solar EUV images

### Description

The AIA instrument onboard the SDO spacecraft provides full disc images in several different UV and EUV wavelength bands. The SIDC redistributes AIA 1024 x 1024 pixels AIA quicklook images at a 3 minutes cadence in near-real-time; 4096 by 4096 pixels AIA and HMI images in science quality at a 1 hour cadence; and videos for the last 24 hours of AIA images in all wavelengths for forecasting purposes.

### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-S106-federated

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## S.107a UGraz/KSO Halpha Solar images

### Description

At Kanzelhöhe Observatory the chromosphere is observed in Hα every day from about 8:00 to 16:00 CET/CEST (when the weather is sufficiently clear). The images are processed immediately and available in near real-time as coloured JPEG with a heliographic grid overlaid. Additionally images with removed large scale variations like limb darkening are made available as high contrast images. These images and the raw FITS data is transferred to the archive every five minutes. The 360 degrees panoramic view shows the actual weather conditions at the observatory.

### Status

Ready

### Provider

Kanzelhöhe Observatory for Solar and Environmental Research (KSO)

### Portal Entry Point

https://swe.ssa.esa.int/kso-S107a-federated

## S.107c UGraz/KSO Solar flare detections

### Description

Every minute a new full disc Hα image of the Sun is acquired at Kanzelhöhe Observatory, the image quality is checked immediately. If the image quality is good enough these images are processed by an image recognition algorithm called surya which detects flaring regions and filaments. If a region reaches a certain intensity and size a flare event is detected. An active region number is given for a detected flare if this number is available for this region.

### Status

Ready

### Provider

Kanzelhöhe Observatory for Solar and Environmental Research (KSO)

### Portal Entry Point

https://swe.ssa.esa.int/kso-S107c-federated

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## S.107d UGraz/KSO Solar flare alerts

### Description

Every minute a new full disc Hα image of the Sun acquired at Kanzelhöhe Observatory, the image quality is checked immediately. If the image quality is good enough these images are processed by an image recognition algorithm called surya which detects flaring regions and filaments. If a region reaches a certain intensity and size a flare event is detected and an alert is issued. The latest alert message is shown here. Only flares of a size larger than 50 microhemispheres will issue an alert. Emails are sent out for flares of at least importance class 1. Registration for flare alert emails is available via the menu entry "Email Subscription".

### Status

Ready

### Provider

Kanzelhöhe Observatory for Solar and Environmental Research (KSO)

### Portal Entry Point

https://swe.ssa.esa.int/kso-S107d-federated

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## S.107e UGraz/KSO White light Solar images

### Description

At Kanzelhöhe Observatory the photosphere is observed in Whitelight every day from about 8:00 to 16:00 CET/CEST (when the weather is sufficiently clear). The images are processed immediately and available in near real-time as a JPEG with a heliographic grid overlaid. Additionally, images with removed large scale variations like limb darkening are made available as high contrast images. These images and the raw FITS data is transferred to the archive every five minutes. The 360 degrees panoramic view shows the actual weather conditions at the observatory.

### Status

Ready

### Provider

Kanzelhöhe Observatory for Solar and Environmental Research (KSO)

### Portal Entry Point

https://swe.ssa.esa.int/kso-S107e-federated

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## S.107f UGraz/KSO Solar filament detection

### Description

Every hour the filaments detected by the feature recognition algorithm are combined to a single filament image. For each filament the position, the area, the length, and the east-west and the south-north ranges are calculated. Place the mouse pointer over a filament to get information about it. The images are updated every hour. The 360 degrees panoramic view shows the actual weather conditions at the observatory.

### Status

Ready

### Provider

Kanzelhöhe Observatory for Solar and Environmental Research (KSO)

### Portal Entry Point

https://swe.ssa.esa.int/kso-S107f-federated

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## S.107g UGraz/KSO Halpha light curves

### Description

At Kanzelhöhe Observatory the chromosphere is observed in Hα every day from about 8:00 to 16:00 CET/CEST (when the weather is sufficiently clear). A light curve is determined using the brightness of those recorded images. A plot showing the Hα light curves is provided here in near real-time, and updated every 2 minutes. When a solar flare occurs in the solar chromosphere, a spike is visible on the curves nearly simultaneously. The brightness increase can be several times higher than the quiet chromosphere brightness level. The 360 degrees panoramic view shows the actual weather conditions at the observatory.

### Status

Ready

### Provider

Kanzelhöhe Observatory for Solar and Environmental Research (KSO)

### Portal Entry Point

https://swe.ssa.esa.int/kso-S107g-federated

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## S.107h UGraz/KSO F10.7 and F30 forecasts

### Description

The F10.7and F30 radio flux indices are used as a proxy of the solar EUV radiation and required by most models to characterize the state of the thermosphere and for thermospheric drag calculation, in order to specify satellite orbits, re-entry services, collision avoidance maneuvers and modeling of space debris evolution. The daily F10.7 and F30 forecasts are optimized for short-term changes with lead times up to 3 days. The plots show the observed data over the last week and over 30 days together with the daily forecasts for one, two and three days into the future. The plots are updated hourly.

### Status

Ready

### Provider

Kanzelhöhe Observatory for Solar and Environmental Research (KSO)

### Portal Entry Point

https://swe.ssa.esa.int/kso-S107h-federated

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### S.108 SIDC/SILSO International sunspot number

#### Description

The World Data Centre for the International Sunspot Number collects observations of sunspots from a network of about 85 observers around the world and produces the daily International Sunspot number and its monthly and yearly means (the time series extends back over several centuries). An estimated sunspot number (EISN) is updated continuously in near-real-time (5 minutes) up to the current day of the month. Provisional numbers for the past month are produced on the first day of each calendar month. A final update of the monthly provisional numbers is done after a delay of 3 months to establish the definitive Sunspot Numbers.

#### Status

Ready

#### Provider

Solar Influences Data analysis Center (SIDC)

#### Portal Entry Point

https://swe.ssa.esa.int/sidc-S108-federated

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### S.108b SIDC/SILSO Sunspot number forecast

#### Description

The SIDC/SILSO (Sunspot Index and Long-term Solar Observations) produces 12 months ahead predictions of the monthly smoothed sunspot number using three different methods. In addition, for each of the methods, there is also a Kalman filter optimised version available.

#### Status

Ready

#### Provider

Solar Influences Data analysis Center (SIDC)

#### Portal Entry Point

https://swe.ssa.esa.int/sidc-S108b-federated

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### S.109a SIDC 10.7cm Solar radio flux (F10.7) forecast

#### Description

The forecaster on duty at the SIDC produces each day (nominal issuetime 12:30UT) a forecast of the F10.7 radio flux as it is expected to be observed over the next 3 days (the day of issue

included). The forecast is based on a combination of statistical techniques and expert judgement on the evolution of active regions on the solar disc including regions rotating onto or off the disc.

### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-S109a-federated

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## S.109b SIDC Solar flare forecast

### Description

The forecaster on duty at the SIDC produces each day (nominal issuetime 12:30UT) a probabilistic forecast for the occurrence of X-ray flares over the next 24h time span. Probabilities are provided for flare classes C, M and X separately. A full disc as well as an active region specific forecast is provided where region identification schemes of both NOAA and Catania Observatory are being considered. The forecast is based on a combination of statistical techniques based on the active region properties and expert judgement on the evolution of active regions on the solar disc including regions rotating onto or off the disc.

### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-S109b-federated

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## S.109c UKMO Solar flare forecast

### Description

To determine the probability of solar flares, the Met Office Space Weather Operations Centre (MOSWOC) forecaster calculates a set of raw flare forecasts using an empirical model (observational statistics of flare events for each McIntosh class spanning several decades). These are assessed by the forecaster, who then makes a subjective assessment of current space weather conditions to produce a final probability percentage. The accuracy of this is routinely verified.

**Status**

Ready

**Provider**

UK Met Office (UKMO)

**Portal Entry Point**

https://swe.ssa.esa.int/ukmo-S109c-federated

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## S.109e FLARECAST Solar flare forecast

**Description**

FLARECAST uses a machine learning algorithm to compute for a given point in time the probability of occurrence of a solar flare within the next day.

**Status**

Currently unavailable.

**Provider**

Institute for Data Science (I4DS)

**Portal Entry Point**

https://swe.ssa.esa.int/fhnw-S109e-federated

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## S.110 SIDC Daily space weather bulletin

**Description**

The forecaster on duty at the SIDC produces each day (nominal issuetime 12:30UT) a daily bulletin of Solar and Space Weather. The bulletin includes a summary of the observed activity over the past 24h, as well as an outlook on the activity for the next days.

**Status**

Ready

**Provider**

Solar Influences Data analysis Center (SIDC)

**Portal Entry Point**

https://swe.ssa.esa.int/sidc-S110-federated

## S.111 SIDC/CACTus Automated CME detection

### Description

CACTus is a software routine that autonomously detects coronal mass ejections (CMEs) in image sequences from SOHO/LASCO. The output is a list of events, similar to the classic catalogs, with principal angle, angular width and velocity estimation for each CME.

### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-S111-federated

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## S.112a SIDC Solar GOES-flare alert

### Description

The SIDC data processing pipeline analyses incoming GOES X-ray data in near-real-time and reports on the occurrence of X-ray flares of Classes M5 and up.

### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-S112a-federated

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## S.112b SIDC/CACTus Automated halo CME alert

### Description

The SIDC data processing pipeline analyses the outcome of the near-real-time runs of the CACTus package and alerts for the occurrence of CMEs with an angular width of over 150 degrees.

### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-S112b-federated

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## S.112z SIDC Human operator alert moderation

### Description

The forecaster on duty at the SIDC observes and processes all relevant Space Weather data, including automated feature alert processes. Based on his/her observations the forecaster on duty triggers alerts where automated processes have failed or are late and follows up and provides complementary information on the automated alerts.

### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-S112z-federated

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## S.113 SIDC All quiet alert

### Description

Based on the Space Weather forecasts produced by the forecaster on duty at the SIDC, periods when the overall Space Weather conditions are expected to be or remain exceptionally quiet are marked as "All quiet". The conditions for marking expectations as "All Quiet", observe a time horizon of 48 hours in the future with flaring expected to remain below C level, solar wind parameters to be at nominal levels and geomagnetic conditions to be at quiet to unsettled levels (K<4).

### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-S113-federated

## S.121 INAF/OACT White light Solar images

### Description

When the weather conditions permit, every 60 minutes a full disc image of the Sun in the continuum (656.78 nm ± 0.25 nm) near the Hα line is displayed. The images are recorded with a size of 2048 x 2048 pixels and a dynamic range of 16 bit.

### Status

Ready

### Provider

Catania Astrophysical Observatory (OACT)

### Portal Entry Point

https://swe.ssa.esa.int/catania-S121-federated

## S.122 INAF/OACT Halpha Solar images

### Description

When the weather conditions permit, every 1 minute a full disc image of the Sun in the center of the Hα line (656.28 nm ± 0.25 nm) is displayed. The images are recorded with a size of 2048 x 2048 pixels and a dynamic range of 16 bit.

### Status

Ready

### Provider

Catania Astrophysical Observatory (OACT)

### Portal Entry Point

https://swe.ssa.esa.int/catania-S122-federated

## S.123a INAF/OACT Sunspot group characteristics

### Description

When the weather conditions permit, daily drawings of sunspot groups and pores are made using a a Cooke refractor (150mm/2230 mm) on a 24.5 cm diameter projected image of the Sun. These drawings are used to determine some characteristics of the SunSPotS groups visible on the photosphere and to report them in form of a numerical code (ursigram), named USSPS.

### Status

Ready

### Provider

Catania Astrophysical Observatory (OACT)

### Portal Entry Point

https://swe.ssa.esa.int/catania-S123a-federated

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## S.123b SIDC/USET Sunspot group characteristics

### Description

The operator of the SIDC local observing facilities (Uccle Solar Equatorial Table) produces every day a drawing of the white light Solar disc as it appears projected on paper sheet. The analysis of the drawing provides characteristics of the Sunspot groups visible on the disc and occurs through a combination of human interaction (grouping spots together and judging their classification) and automated routines (calculation of the area and position).

### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-S123b-federated

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## S.123c UKMO Solar active region analysis

### Description

The Solar Region Analysis is undertaken by the Met Office Space Weather Operations Centre (MOSWOC) forecaster using GONG H-Alpha imagery and 4K SDO/AIA and SDO/HMI images (4096 resolution) from the SDO website, along with Helioviewer software to determine the heliographic parameters (such as location in latitude and longitude) of any active regions. The forecaster analyses the sunspots Using the Zurich and Mount Wilson classification methodologies. The active solar regions are identified by using the NOAA SWPC active region numbers.

### Status

Ready

### Provider

UK Met Office (UKMO)

### Portal Entry Point

https://swe.ssa.esa.int/ukmo-S123c-federated

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## S.123d ASUCAS/SPS Sunspot group characteristics

### Description

When weather permits, the sunspot group classification is provided by an observer on duty of Solar Patrol Service (SPS)/ASU CAS. The analysis of solar active regions is based on a sunspot drawing. For each observed active region this product provides: NOAA number, SPS/ASU CAS archive number, Carrington heliographic coordinates (longitude - L and latitude B), central meridian distance (CMD), McIntosh sunspot classification, number of spots per active region. The date and time of observation, together with seeing conditions, can be found in the header.

### Status

Ready

### Provider

Solar Patrol Service (SPS)

### Portal Entry Point

https://swe.ssa.esa.int/sps-S123d-federated

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## S.124 A-EFFort Solar flare forecast

### Description

This product pertains to the prediction of major solar flares, using the methodology published by RCAAM / Academy of Athens researchers. It provides 24-hour forecast probabilities for GOES class M1+, M5+, X1+ and X5+ flares ("+" meaning cumulative, of a certain class and above). There is zero latency for forecasts, meaning that forecasts are effective immediately upon issue. Forecast refresh time is three (3) hours and the product includes a remaining-time countdown until the next forecast.

### Status

Ready

### Provider

Institute for Astronomy, Astrophysics, Space Applications & Remote Sensing (IAASARS)

### Portal Entry Point

https://swe.ssa.esa.int/iaasars_s-federated

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## S.126 SIDC Automated coronal hole detection

### Description

Coronal holes are regions of open magnetic field on the Sun which appear as dark patches on the surface of the Sun when viewed in Extreme-Ultra-Violet (EUV) and X-ray emission. The coronal holes are automatically detected in EUV solar images from SDO/AIA data at 193Å using the SPoCA suite software and a set of characteristics are extracted, including: area, time of the first and last detection in observations and location.

### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-S126-federated

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## S.127 SIDC Solar EUV flare detection

### Description

Solar flares are a sudden release of energy stored in inductive magnetic fields. The Solar Influences Data analysis Centre (SIDC) Extreme UltraViolet (EUV) flare detections are the output of the automated SIDC Solar Demon algorithm, that detects the occurrence of flares in 9.4nm NASA Solar Dynamics Observatory mission / Atmospheric Imaging Assembly (SDO/AIA) images by means of a region-based detection algorithm. The algorithm runs as soon as level 1.5 synoptic quick-look data of on SDO/AIA 9.4nm data are available.

### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-S127-federated

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### S.501a ASUCAS/SPS Solar flare forecast

#### Description

Every day at 17:00 UTC an observer/forecaster on duty at ASUCAS/SPS issues a probabilistic flare forecast for three solar flare classes C, M and X. These flare classes are defined according to the peak of the flux of soft X-ray radiation produced by the flare. The forecast consists of two parts: full disc and per visible active regions. Full disc flare forecast then combines the probabilities of flare occurrence in visible active regions into a one global forecast. The forecast is human generated and is valid for next 24 hours from the time of issue.

#### Status

Ready

#### Provider

Solar Patrol Service (SPS)

#### Portal Entry Point

https://swe.ssa.esa.int/sps-S501a-federated

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### S.508b CLS F10.7 and F30 nowcast & forecast

#### Description

Solar radio fluxes measured at 10.7 cm (F10.7) and 30 cm (F30) are good proxies for the EUV forcing of the Earth's upper atmosphere. They are used, for example, as inputs for density models of the thermosphere. Their prediction is therefore of high interest to satellite operators. CLS has developed algorithms to interpolate data gaps, to correct anomalous data and to forecast the indices up to 30 days ahead with a multi-wavelength non-recursive neural network. This service allows the user to visualize and export the nowcast and the forecast values in an human interactive or machine-to-machine way.

#### Status

Ready

#### Provider

Collecte Localisation Satellites (CLS)

#### Portal Entry Point

https://swe.ssa.esa.int/cls-federated

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### S.600z SIDC Moderated Solar Weather Event list

#### Description

This service provides a list of solar weather events (sunspot groups, solar flares, and coronal holes) compiled daily by the forecaster on duty at the SIDC (RWC Belgium) starting from existing reference event lists.

#### Status

Ready

#### Provider

Solar Influences Data analysis Center (SIDC)

#### Portal Entry Point

https://swe.ssa.esa.int/sidc-S600z-federated

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### S.790a ICAO Space Weather Advisory browser

#### Description

The Solar Influences Data analysis Centre (SIDC) provides a tool to access and browse through the official advisories on space weather impacts on aviation, issued for the International Civil Aviation Organisation (ICAO). Advisories are created for three different impact categories: GNSS, HF communication and Radiation. The ICAO Space Weather Advisory browser offers access to both the latest advisories and an archive.

#### Status

Ready

#### Provider

Solar Influences Data analysis Center (SIDC)

#### Portal Entry Point

https://swe.ssa.esa.int/sidc-S790a-federated

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### S.801a ASUCAS/SPS Daily space weather bulletin

#### Description

The daily space weather bulletin is a text report that briefly summarizes current solar activity (sunspot groups, active prominences, etc.) visible on the solar disc for past 24h and predicts its evolution for maximum of 24h. For preparation of the bulletin an observer/forecaster on duty at

ASUCAS/SPS site exploits observations made on the site (sunspot drawings, classification, white light and Halpha synoptic images) as well as other relevant publicly available solar data.

**Status**

Ready

**Provider**

Solar Patrol Service (SPS)

**Portal Entry Point**

https://swe.ssa.esa.int/sps-S801a-federated

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## 1.2. Heliospheric weather products

### H.101a Near-Earth solar wind forecasts (Enlil Ensemble)

**Description**

These forecasts are produced by UK Met Office forecasters using the WSA-Enlil Model and SOHO LASCO coronagraph images. The model is a large-scale, physics-based prediction model of the heliosphere and provides 1-4 day advance warning of solar wind structures and Earth-directed coronal mass ejections (CMEs). For times when there are significant Earthward directed CMEs an additional ensemble panel is produced. This consists of a low resolution version of the Enlil model which is run 24 times with different perturbations on the CME characteristics. Time series plots of the solar wind density and speed at the Near-Earth location are plotted for each member the spread providing an indication of the uncertainty.

**Status**

Ready

**Provider**

UK Met Office (UKMO)

**Portal Entry Point**

https://swe.ssa.esa.int/metoffice-enlil-e-federated

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### H.101b Forecast of solar wind high-speed streams (ESWF)

**Description**

Forecast of background solar wind speed based on an empirical relation linking the area of coronal holes observed in remote sensing EUV data and high speed streams measured at Earth after about 4 days. The service product is updated automatically every hour, with a delay of 2

hours to real-time, and compared to actual L1 in-situ measurements. Previous output can be found in the H-ESC archive (see the HPARC/PB product).

### Status

Ready

### Provider

Institute of Physics (IGAM)

### Portal Entry Point

https://swe.ssa.esa.int/graz-eswf-federated

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## H.101c Solar Wind Near-Earth Forecasts (Enlil Ensemble)

### Description

The Solar Wind Near-Earth forecasts are produced by Met Office Space Weather Operations Centre (MOSWOC) forecasters using the WSA-Enlil Model and SOHO LASCO coronagraph images. The WSA-Enlil Model is a large-scale, physics-based prediction model of the heliosphere, run on Met Office supercomputers to provide 1-4 day advance warning of solar wind structures and Earth-directed coronal mass ejections (CMEs) that cause geomagnetic storms. For times when there are Earthward directed CMEs an additional ensemble product is produced. This consists of a low resolution version of the Enlil model which is run 24 times with different perturbations on the CME characteristics. Time series plots of the solar wind density and speed at the Near-Earth location are plotted for each member the spread providing an indication of the uncertainty.

### Status

Ready

### Provider

UK Met Office (UKMO)

### Portal Entry Point

https://swe.ssa.esa.int/metoffice-enlil-e-federated

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## H.101e Forecast of solar wind high-speed streams (STEREO+CH)

### Description

Since the fast solar wind speed undergoes only long-term changes, as it emanates from long-lived and stable coronal holes, we use a persistence model to forecast the solar wind speed at Earth. An estimate of the uncertainty is provided based on changes to the coronal hole measurements between STEREO-A and Earth. As STEREO-A catches up with Earth the lead-time will reduce to zero at the point the spacecraft crosses the Sun-Earth line (August 2023). It will

then pull ahead of the Earth though the accuracy of the persistence forecast will be reduced due to the increased lead-time (almost a whole solar rotation) allowing more time for coronal hole evolution between observation and time to which the forecast applies. Previous output can be found in the H-ESC archive (see the HPARC/PB product).

### Status

Ready

### Provider

Institute of Physics (IGAM)

### Portal Entry Point

https://swe.ssa.esa.int/graz-stereo-ch-federated

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## H.101f AWARE_NEXT Enhanced 24 hour solar wind forecast

### Description

The AWARE NEXT product provides automated prediction of the potentially geo-effective solar wind disturbances called co-rotating interaction regions (CIRs) and the associated trailing high-speed streams (HSSs), estimates the risk for occurrence of CIRs in L1 within the next 24 hours.

### Status

Ready

### Provider

DTU Space (DTU)

### Portal Entry Point

https://swe.ssa.esa.int/dtu-aware-next-federated

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## H.101g Near-Earth solar wind forecasts (EUHFORIA)

### Description

EUHFORIA (v 1.0.3) is a 3D MHD heliosphere model that propagates near-Sun solar wind properties and transient related to CME events out into the heliosphere. This product makes use of the version of EUHFORIA that is installed and accessible via the Virtual Space Weather Modelling Centre VSWMC as described in S. Poedts, 2018. The product is generated on a daily schedule with the latest model results being presented to the user. The EUHFORIA product is run automatically each morning and makes use of the current published Enlil/E configuration available from UK Met Office at that time. This is the version of the product for target Earth. The product is currently considered a prototype and so is only accessible via the H-ESC home page.

### Status

Product provided for demonstration, not assigned to service.

### Provider

STFC, RAL Space (RAL Space)

### Portal Entry Point

https://swe.ssa.esa.int/ral-euhforia-e-federated

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## H.101h Forecast of solar wind high-speed streams ESWF24

### Description

ESWF24 service provides a reliable short-term solar wind speed forecast over three time windows: 24h, 36h and 48h (red, black and green lines, respectively, in the top and middle panels). The algorithm relates solar wind measurements one day ahead with the fractional coronal hole area observed three days before the current moment (ESWF service using NASA SDO/AIA EUV data; see Vrsnak, Temmer, Veronig, 2007). For the data assimilation, in-situ SOLAR-1 density and speed information is used together with a Kalman filter technique developed by SKOLTECH (Podladchikova et al., 2018 - COSPAR, EGU).

### Status

Ready

### Provider

Institute of Physics (IGAM)

### Portal Entry Point

https://swe.ssa.esa.int/graz-eswf24-federated

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## H.101i Solar Wind Flux Tube (SWiFT) forecast

### Description

SWiFT computes a 4-day forecasts of coronal and solar wind MHD parameters (speed, density and magnetic field) along magnetic field lines connected to the Earth.

### Status

Ready

### Provider

Infor'marty (Infor'marty)

### Portal Entry Point

https://swe.ssa.esa.int/informarty-swift-federated

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## H.101z Solar Wind Forecast Speed Comparison

### Description

The H-ESC provides a number of different models to forecast the solar wind speed at Earth. These are based on a variety of inputs techniques such as physics based, use of empirical relations or assumptions on the persistence of conditions from the previous solar rotation or measured by satellites in other locations with solar system. Each model has its own characteristics and caveats that means it may work better or worse depending on current space weather conditions or has other advantages such as fast computation allowing many iteration, ensemble modelling. The H-ESC H.101z combined solar wind speed visualisation product provides a simplified, low-resolution, overview of the various model results in order to aid comparison of the different forecast solar wind speeds over the next few days. This is aimed at supporting the assessment, selection and use of these models.

### Status

Ready

### Provider

STFC, RAL Space (RAL Space)

### Portal Entry Point

https://swe.ssa.esa.int/ral-swfsc-e-federated

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## H.102a Near-Earth NRT solar wind

### Description

This product is a graphical nowcast representation of the observational data available from the SOLAR-1 satellite. This includes:1) Bulk Wind Speed, 2) Proton Density, 3) Proton Temperature, 4) Magnetic Field.

### Status

Ready

### Provider

UK Met Office (UKMO)

### Portal Entry Point

https://swe.ssa.esa.int/metoffice-sw-l1-federated

## H.103a Near-Earth CME arrival time predictions (Enlil Ensemble)

### Description

This product is generated by Met Office Space Weather Operations Centre (MOSWOC) forecaster based on Enlil model output, described in product description H101a and H101c (ensemble). The CME arrival time forecast will be included within the forecaster's commentary. For times when there are Earthward directed CMEs an ensemble run of the model is also used. This consists of a low resolution version of the Enlil model which is run 24 times with different perturbations on the CME characteristics. The forecasters assess the output to determine the likely spread in arrival times.

### Status

Ready

### Provider

UK Met Office (UKMO)

### Portal Entry Point

https://swe.ssa.esa.int/metoffice-enlil-e-federated

## H.103c Heliospheric propagation tool

### Description

The propagation tool supports the assessment of CME (Coronal Mass Ejections) and CIR (Corotating Interaction Regions) and SEP (Solar Energetic Particle) arrival times at planets, spacecraft and other solar system objects such as comets. It supports the tracking of heliospheric structures using white light J-maps and has access to catalogues of CME/CIR trajectories. It is also connected to science archives of in-situ data (AMDA) and imagery data to assist with posteriori analysis.

### Status

Ready

### Provider

Centre de Données de la Physique des Plasmas (CDPP)

### Portal Entry Point

https://swe.ssa.esa.int/cdpp-proptol-federated

### H.103d Magnetic Effectiveness Tool

#### Description

MagEffTool is a new product used for the in-situ detection of the magnetic flux-rope structures embedded in coronal mass ejections, an estimation of these structures based on the magnetic helicity, plus context plots for geoeffectiveness inspection.

#### Status

Ready

#### Provider

Turin Astrophysical Observatory (OATO)

#### Portal Entry Point

https://swe.ssa.esa.int/inaf-mageff-federated

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### H.103e CME propagation prediction tool

#### Description

The CME Propagation Prediction Tool provides an early warning related to Coronal Mass Ejections (CMEs) detected in coronagraphic images acquired by the SOHO/LASCO coronagraphs and potentially propagating towards Earth, and a model of the ecliptic configuration of the interplanetary solar wind derived from in-situ plasma measurements obtained with the SOLAR-1/SWiPS and STEREO-A/PLASTIC instruments.

#### Status

Product provided for demonstration, not assigned to service.

#### Provider

Turin Astrophysical Observatory (OATO)

#### Portal Entry Point

https://swe.ssa.esa.int/inaf-cmeprop-federated

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### H.105a Near-Earth NRT energetic particles

#### Description

This product is a graphical representation of the observational data available from the GOES satellites. The Proton Flux from the geostationary Primary and Secondary GOES operational spacecraft are displayed.

### Status

Ready

### Provider

UK Met Office (UKMO)

### Portal Entry Point

https://swe.ssa.esa.int/metoffice-sep-e-federated

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## H.106a Near-Earth space weather notifications

### Description

This product is generated by Met Office Space Weather Operations Centre (MOSWOC) forecaster based on available all data and model output. H.106a Near-Earth Space Weather Alerts describes relevant notifications (alerts, watches, and warnings) issued by the Met Office.

### Status

Ready

### Provider

UK Met Office (UKMO)

### Portal Entry Point

https://swe.ssa.esa.int/metoffice-alerts-e-federated

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## H.106b Automated WARnings of Earth arrivals (AWARE)

### Description

This product provides an automated detection and subsequent classification of solar wind disturbances arriving at the L1 point. Focus is on disturbances with a potential for creating geomagnetic storms. Periods of significantly enhanced magnetic field are identified and classified according to their most likely cause, being either propagating ICMEs or high speed streams creating SIRs (including CIRs). In addition, significant interplanetary shocks are identified. Independently Kp is predicted 1-2h ahead based on the latest solar wind measurements. Previous output can be found in the H-ESC archive (see the HPARC product).

### Status

Ready

### Provider

DTU Space (DTU)

### Portal Entry Point

https://swe.ssa.esa.int/dtu-aware-federated

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## H.107a_Mars Heliospheric solar wind forecasts for Mars based on 3D-MHD modelling using Enlil

### Description

The Solar Wind Mars forecasts are produced by Met Office Space Weather Operations Centre (MOSWOC) forecasters using the WSA-Enlil Model and SOHO LASCO coronagraph images. The WSA-Enlil Model is a large-scale, physics-based prediction model of the heliosphere that provides 1-4 day advance warning of solar wind structures and target-directed coronal mass ejections (CMEs) that can cause space weather effects.

### Status

Ready

### Provider

UK Met Office (UKMO)

### Portal Entry Point

https://swe.ssa.esa.int/metoffice-enlil-ma-federated

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## H.107a_Mercury Heliospheric solar wind forecasts for Mercury based on 3D-MHD modelling using Enlil

### Description

The Solar Wind Mercury forecasts are produced by Met Office Space Weather Operations Centre (MOSWOC) forecasters using the WSA-Enlil Model and SOHO LASCO coronagraph images. The WSA-Enlil Model is a large-scale, physics-based prediction model of the heliosphere that provides 1-4 day advance warning of solar wind structures and target-directed coronal mass ejections (CMEs) that can cause space weather effects.

### Status

Ready

### Provider

UK Met Office (UKMO)

### Portal Entry Point

https://swe.ssa.esa.int/metoffice-enlil-me-federated

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### H.107a_Venus Heliospheric solar wind forecasts for Venus based on 3D-MHD modelling using Enlil

#### Description

The Solar Wind Venus forecasts are produced by Met Office Space Weather Operations Centre (MOSWOC) forecasters using the WSA-Enlil Model and SOHO LASCO coronagraph images. The WSA-Enlil Model is a large-scale, physics-based prediction model of the heliosphere that provides 1-4 day advance warning of solar wind structures and target-directed coronal mass ejections (CMEs) that can cause space weather effects.

#### Status

Ready

#### Provider

UK Met Office (UKMO)

#### Portal Entry Point

https://swe.ssa.esa.int/metoffice-enlil-v-federated

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### H.107b Solar wind propagation (Heliopropa)

#### Description

The Heliopropa tool uses a simple 1D MHD code to propagate in-situ L1 data to provide background solar wind parameters at other locations within the solar system.

#### Status

Ready

#### Provider

Centre de Données de la Physique des Plasmas (CDPP)

#### Portal Entry Point

https://swe.ssa.esa.int/cdpp-heliopropa-federated

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### H.107c_Mars Mars solar wind forecasts (EUHFORIA)

#### Description

EUHFORIA (v 1.0.3) is a 3D MHD heliosphere model that propagates near-Sun solar wind properties and transient related to CME events out into the heliosphere. This product makes use of the version of EUHFORIA that is installed and accessible via the Virtual Space Weather Modelling Centre VSWMC as described in S. Poedts, 2018. The product is generated on a daily

schedule with the latest model results being presented to the user. The EUHFORIA product is run automatically each morning and makes use of the current published Enlil/Ma configuration available from UK Met Office at that time. This is the version of the product for target Mars. The product is currently considered a prototype and so is only accessible via the H-ESC home page.

### Status

Product provided for demonstration, not assigned to service.

### Provider

STFC, RAL Space (RAL Space)

### Portal Entry Point

https://swe.ssa.esa.int/ral-euhforia-ma-federated

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## H.107c_Mercury Mercury solar wind forecasts (EUHFORIA)

### Description

EUHFORIA (v 1.0.3) is a 3D MHD heliosphere model that propagates near-Sun solar wind properties and transient related to CME events out into the heliosphere. This product makes use of the version of EUHFORIA that is installed and accessible via the Virtual Space Weather Modelling Centre VSWMC as described in S. Poedts, 2018. The product is generated on a daily schedule with the latest model results being presented to the user. The EUHFORIA product is run automatically each morning and makes use of the current published Enlil/Me configuration available from UK Met Office at that time. This is the version of the product for target Mercury. The product is currently considered a prototype and so is only accessible via the H-ESC home page.

### Status

Product provided for demonstration, not assigned to service.

### Provider

STFC, RAL Space (RAL Space)

### Portal Entry Point

https://swe.ssa.esa.int/ral-euhforia-me-federated

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## H.107c_Venus Venus solar wind forecasts (EUHFORIA)

### Description

EUHFORIA (v 1.0.3) is a 3D MHD heliosphere model that propagates near-Sun solar wind properties and transient related to CME events out into the heliosphere. This product makes use of the version of EUHFORIA that is installed and accessible via the Virtual Space Weather

Modelling Centre VSWMC as described in S. Poedts, 2018. The product is generated on a daily schedule with the latest model results being presented to the user. The EUHFORIA product is run automatically each morning and makes use of the current published Enlil/V configuration available from UK Met Office at that time. This is the version of the product for target Venus. The product is currently considered a prototype and so is only accessible via the H-ESC home page.

### Status

Product provided for demonstration, not assigned to service.

### Provider

STFC, RAL Space (RAL Space)

### Portal Entry Point

https://swe.ssa.esa.int/ral-euhforia-v-federated

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## H.108a_Mars CME Tailored Heliospheric arrival predictions

### Description

The expected arrival time of any target directed CMEs are reported in the forecaster commentary displayed below the H.107a model output and CME input list.

### Status

Ready

### Provider

UK Met Office (UKMO)

### Portal Entry Point

https://swe.ssa.esa.int/metoffice-enlil-ma-federated

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## H.108a_Mercury CME Tailored Heliospheric arrival predictions

### Description

The expected arrival time of any target directed CMEs are reported in the forecaster commentary displayed below the H.107a model output and CME input list.

### Status

Ready

### Provider

UK Met Office (UKMO)

### Portal Entry Point

https://swe.ssa.esa.int/metoffice-enlil-me-federated

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## H.108a_Venus CME Tailored Heliospheric arrival predictions

### Description

The expected arrival time of any target directed CMEs are reported in the forecaster commentary displayed below the H.107a model output and CME input list.

### Status

Ready

### Provider

UK Met Office (UKMO)

### Portal Entry Point

https://swe.ssa.esa.int/metoffice-enlil-v-federated

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## H.108b CME arrival time predictions (Drag Based Ensemble Model Tool)

### Description

The Drag-Based Ensemble Model (DBEM) tool provides predictions of the Interplanetary Coronal Mass Ejection (ICME) travel and its arrival at an arbitrary ecliptic-plane location. Calculations are based on the standard DBM assumption that the dominant force is the MHD equivalent of aerodynamic drag. In the ensemble version the model is run multiple times by perturbing input parameters to build up a statistical view of the most likely outcome. The DBEM includes the ability to specify the CME geometry using either cone model or the graduated cylindrical shell model characteristics of the CME. By incorporating dynamic background solar wind speed, now DBEM is able to provide Earthward directed CME arrival times and speed with more accuracy.

### Status

Ready

### Provider

Institute of Physics (IGAM)

### Portal Entry Point

https://swe.ssa.esa.int/graz-dbem-federated

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## H.109a Magnetic Connectivity Tool

### Description

The Magnetic Connectivity Tool can help a user to estimate the solar source location of the solar wind and energetic particles measured by different spacecraft. In doing so, the tool will model the coronal and interplanetary magnetic field based on different assumptions and techniques. Currently the coronal model is primarily based on a magnetostatic reconstruction technique called the Potential Field Source Surface (PFSS) model and the interplanetary magnetic field is assumed to be a Parker spiral. If the date/time falls in the future, the tool uses forecasts of magnetic connectivity provided by the ADAPT magnetograms with flux transport. Forecasts of magnetic connectivity will be useful to Solar Orbiter operations and are provided up to 10 days out in the future.

### Status

Ready

### Provider

Infor'marty (Infor'marty)

### Portal Entry Point

https://swe.ssa.esa.int/informarty-magctool-federated

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## H.109b Shock tool

### Description

The shock tool is a fast 3D coronal shock wave propagation module developed to provide quick modeling of shock wave properties in the corona and establish how these shocks connect to specific points of interest in the inner heliosphere. This approach is a first step towards forecasting Solar Energetic Particles (SEPs), the latter feature will be fully implemented in a future update of the tool. At this stage, the Shock Tool forecasts the 3-D expansion speed of a shock wave erupting from a specific Active Region (AR).

### Status

Ready

### Provider

Infor'marty (Infor'marty)

### Portal Entry Point

https://swe.ssa.esa.int/informarty-shocktool-federated

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## H.110a_Mars Tailored Heliospheric Space Weather Alerts

### Description

Space weather alerts (notifications) are provided as part of the forecaster commentary section (i.e. in conjunction with H.108a). Notifications are currently limited to assessment of high speed streams based on the H.107a heliospheric model output.

### Status

Ready

### Provider

UK Met Office (UKMO)

### Portal Entry Point

https://swe.ssa.esa.int/metoffice-enlil-ma-federated

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## H.110a_Mercury Tailored Heliospheric Space Weather Alerts

### Description

Space weather alerts (notifications) are provided as part of the forecaster commentary section (i.e. in conjunction with H.108a). Notifications are currently limited to assessment of high speed streams based on the H.107a heliospheric model output.

### Status

Ready

### Provider

UK Met Office (UKMO)

### Portal Entry Point

https://swe.ssa.esa.int/metoffice-enlil-me-federated

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## H.110a_Venus Tailored Heliospheric Space Weather Alerts

### Description

Space weather alerts (notifications) are provided as part of the forecaster commentary section (i.e. in conjunction with H.108a). Notifications are currently limited to assessment of high speed streams based on the H.107a heliospheric model output.

### Status

Ready

### Provider

UK Met Office (UKMO)

### Portal Entry Point

https://swe.ssa.esa.int/metoffice-enlil-v-federated

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## H.110b Automated WARnings of STEREO_A arrivals (AWARE_A)

### Description

The STEREO-A Near-Real-Time alert service Automated WARnings of STEREO-A arrivals (AWARE_A) product provides an automated detection and subsequent classification of solar wind disturbances arriving at the location of the STEREO-A spacecraft. The product requires solar wind in situ plasma and magnetic field observations. These are currently provided in NRT STEREO-A. Periods of significantly enhanced magnetic field are identified and classified according to their most likely cause, being either propagating ICMEs or high speed streams creating SIRs (including CIRs). In addition, significant interplanetary shocks are identified. Independently Kp is predicted 1-2h ahead based on the latest solar wind measurements. Previous output can be found in the H-ESC archive (see the HPARC product).

### Status

Ready

### Provider

DTU Space (DTU)

### Portal Entry Point

https://swe.ssa.esa.int/dtu-aware-a-federated

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## H.112a H-ESC product assessment Report

### Description

The H-ESC product assessment report provides a monthly overview of the events identified during the interval and the accuracy with which they could be determined. Initially this activity is focused on CME arrival and solar wind speed forecasts.

### Status

Ready

### Provider

STFC, RAL Space (RAL Space)

### Portal Entry Point

https://swe.ssa.esa.int/ral-hparc-par-federated

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## H.113a H-ESC archive product browser

### Description

The H-ESC product browser provides a quick way to review the H-ESC products as they were available at a specific time.

### Status

Ready

### Provider

STFC, RAL Space (RAL Space)

### Portal Entry Point

https://swe.ssa.esa.int/ral-hparc-pb-federated

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## H.114a Automated Multi Dataset Analysis (AMDA)

### Description

The AMDA system provides an archive of planetary, solar wind, Earth magnetosphere and ionosphere mission and ground based products. In addition it supports a range of standard models such as magnetic footprints, magnetic fields, solar wind propagation to planets and probes as well as access to external databases of observations and simulations. A key functionality of the system is its embedded plotting, data mining and cataloguing functionalities which are extremely useful in relation to posteriori analysis.

### Status

Ready

### Provider

Centre de Données de la Physique des Plasmas (CDPP)

### Portal Entry Point

https://swe.ssa.esa.int/cdpp-amda-federated

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### H.115a H-ESC statistical products

#### Description

The H-ESC statistical products tool allows the calculation of statistical parameters and event lists based on long time series of data such as solar wind parameters.

#### Status

Ready

#### Provider

STFC, RAL Space (RAL Space)

#### Portal Entry Point

https://swe.ssa.esa.int/ral-hparc-stat-federated

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### H.120a STEREO-A HI Beacon Mode Background Subtracted Difference Movie

#### Description

The STA/DMvRT product consists of the latest difference heliospheric imager movies based upon the beacon mode data which is available within a few hours of the observation. The product is updated every hour although data from STEREO-A may lag by 5 hours (or more in some situations).

#### Status

Ready

#### Provider

STFC, RAL Space (RAL Space)

#### Portal Entry Point

https://swe.ssa.esa.int/ral-stahi-h120a-federated

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### H.120b STEREO-A HI Time Elongation J-Maps (Beacon Mode)

#### Description

The STA/JMpRT product presents a time - elongation map (also known as a J-map) of the differenced Heliospheric Imager (HI) visible light observations along the position angle corresponding to the ecliptic. This product is based upon the Near-Real-Time beacon mode data; it provides observations acquired over the last seven days and is updated with the latest available observations every couple of hours.

### Status

Ready

### Provider

STFC, RAL Space (RAL Space)

### Portal Entry Point

https://swe.ssa.esa.int/ral-stahi-h120b-federated

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## H.120c STEREO-A HI Time Elongation Annotated J-Maps (Beacon Mode)

### Description

The STA/JMPAR product presents a time - elongation map (also known as a J-map) of the differenced Heliospheric Imager (HI) visible light observations along the position angle corresponding to the ecliptic. This product is based upon the Near-Real-Time beacon mode data; it provides observations acquired over the last seven days and is updated with the latest available observations every couple of hours. This is the annotated version of the plot that includes CME tracks based using near-Sun CME identification and a simple drag-based propagation model.

### Status

Ready

### Provider

STFC, RAL Space (RAL Space)

### Portal Entry Point

https://swe.ssa.esa.int/ral-stahi-h120c-federated

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## H.121a STEREO-A HI Background Subtracted Movie (Science Mode)

### Description

The STA/BSMv product consists of the latest background subtracted heliospheric imager movies based upon the science mode data which may not be available on the ground until up to 5 days after acquisition. The product is updated daily.

### Status

Ready

### Provider

STFC, RAL Space (RAL Space)

### Portal Entry Point

https://swe.ssa.esa.int/ral-stahi-h121a-federated

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## H.121b STEREO-A HI Background Subtracted Difference Movie (Science Mode)

### Description

The STA/DMv product consists of the latest difference heliospheric imager movies based upon the science mode data which may not be available on the ground until up to 5 days after acquisition. The product is updated on daily basis.

### Status

Ready

### Provider

STFC, RAL Space (RAL Space)

### Portal Entry Point

https://swe.ssa.esa.int/ral-stahi-h121b-federated

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## H.121c STEREO-A HI Time Elongation J-Map (Science Mode)

### Description

The STA/JMp product presents a time - elongation plot (also known as a J-map) of the differenced Heliospheric Imager (HI) visible light observations along the position angle corresponding to the ecliptic. This product is based upon the science mode data; it provides observations acquired over the current month and is updated with the latest available observations each day (but depending on the download schedule data may only be available up to 3 or 4 days after acquisition).

### Status

Ready

### Provider

STFC, RAL Space (RAL Space)

### Portal Entry Point

https://swe.ssa.esa.int/ral-stahi-h121c-federated

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## H.121d STEREO-A HI J-Map Annotated (Science Mode)

### Description

The STA/JMPA product presents a time - elongation plot (also known as a J-map) of the differenced Heliospheric Imager (HI) visible light observations along the position angle corresponding to the ecliptic. This product is based upon the science mode data; it provides observations acquired over the current month and is updated with the latest available observations each day (but depending on the download schedule data may only be available up to 3 or 4 days after acquisition). This is the annotated version of the plot that includes CME tracks based using near-Sun CME identification and a simple drag-based propagation model.

### Status

Ready

### Provider

STFC, RAL Space (RAL Space)

### Portal Entry Point

https://swe.ssa.esa.int/ral-stahi-h121d-federated

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## H.200a Virtual Space Weather Modelling Centre

### Description

The Virtual Space Weather Modelling Centre (VSWMC) is a tool that lets you run space weather models either in a stand-alone way or coupled together. The interfaced models allow for end-to-end simulations from the surface of the Sun to the Earths magnetosphere, useful for both space weather forecasting and scientific research. The following models are available: EUHFORIA, Wind-Predict, Multi-VP, NARMAX, SPARX, BPiM, GUMICS4, GORGON-SPACE, CTIP and MCM. The user can select or upload the models input of his choosing and the models' output is visualized with inbuilt tools. The different components of the system are spread out on different compute cluster nodes or platforms for better run-time efficiency.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Centre for mathematical Plasma-Astrophysics (CmPA)

### Portal Entry Point

https://swe.ssa.esa.int/kul-cmpa-federated

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## 1.3. Space radiation products

### R.101 AVIDOS Radiation exposure estimation at aircraft altitude

**Description**

AVIDOS 3.1 is an informational and educational online software for an assessment of cosmic radiation exposure of passengers and aircrew at civil flight altitudes. AVIDOS 3.1 estimates current and future radiation doses due to Galactic Cosmic Radiation and attempts to nowcast radiation exposure due to Solar Energetic Particle events.

**Status**

Ready

**Provider**

Seibersdorf Laboratories (SL)

**Portal Entry Point**

https://swe.ssa.esa.int/avidos-federated

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### R.102 GLE Alert++ service

**Description**

Alerts for ground level enhancement (GLE) events are provided by GLE Alert++. This system produces every minute a General GLE Alert Graph and station alert graphs for all the stations participating in the network.

**Status**

Ready

**Provider**

NKUA Cosmic Ray Group (ANeMoS)

**Portal Entry Point**

https://swe.ssa.esa.int/anemos-federated

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### R.103 Space Environment Information System (SPENVIS)

**Description**

SPENVIS (Space Environment Information System) is a web-based interface for assessing the space environment and its effects on spacecraft systems and crews. The system is used for mission analysis and planning. SPENVIS includes several empirical models of the space

environment covering mainly cosmic rays, solar energetic particles, the natural radiation belts, magnetic fields, space plasmas and the upper atmosphere. A range of engineering models are also available to help assess the effects of the space environment on spacecraft such as surface and internal charging, energy deposition, solar cell damage and SEU rates. Usually these later models take their inputs from the empirical models present in SPENVIS. The system also includes extensive background information on the space environment, the environment models and the related standards.

### Status

Ready

### Provider

BIRA-IASB Space Weather Services ()

### Portal Entry Point

https://spenvis-oidc.ssa-swe.eu

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## R.104 Space Environment Data System (SEDAT)

### Description

SEDAT (Space Environment Data System) is a tool for the engineering analysis of spacecraft charged particle environments. The facility provides access to the ODI database containing a large and comprehensive set of data about that environment as measured in-situ by a number of space missions. The user can select a set of space environment data appropriate to the engineering problem under study. SEDAT also offers a set of software tools, which can operate on the data retrieved from the database. These tools allow the user to carry out a wide range of engineering analyses. SEDAT is using a GUI written in Java.

### Status

Currently unavailable.

### Supporting facility

SWE Data Centre (SWE Portal)

### Portal Entry Point

https://swe.ssa.esa.int/sedat1

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## R.108 Multi-station neutron monitor data

### Description

The multi-station Neutron Monitor data provides continuous measurements of galactic cosmic rays from neutron monitors located around the world.

### Status

Ready

### Provider

NKUA Cosmic Ray Group (ANeMoS)

### Portal Entry Point

https://swe.ssa.esa.int/anemos-federated

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## R.109 PROBA-V/EPT Electron flux spectra time series

### Description

Time series of electron flux spectra in the energy range 0.5-8 MeV as measured by the Energetic Particle Telescope (EPT) on board PROBA-V.

### Status

Ready

### Provider

Center for Space Radiations (CSR)

### Portal Entry Point

https://swe.ssa.esa.int/csr-ept-r109-federated

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## R.110 PROBA-V/EPT Proton flux spectra time series

### Description

Time series of proton flux spectra in the energy range 9.5-248 MeV as measured by the Energetic Particle Telescope (EPT) on board PROBA-V.

### Status

Ready

### Provider

Center for Space Radiations (CSR)

### Portal Entry Point

https://swe.ssa.esa.int/csr-ept-r110-federated

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### R.111 PROBA-V/EPT Helium flux spectra time series

#### Description

Time series of helium flux spectra in the energy range 38-980 MeV as measured by the Energetic Particle Telescope (EPT) on board PROBA-V.

#### Status

Ready

#### Provider

Center for Space Radiations (CSR)

#### Portal Entry Point

https://swe.ssa.esa.int/csr-ept-r111-federated

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### R.112 PROBA-V/EPT Electron flux geographical maps

#### Description

The weekly averaged electron flux in each energy channel in the energy range 0.5-8 MeV as measured by the Energetic Particle Telescope (EPT) on board PROBA-V are provided as a function of geographical position.

#### Status

Ready

#### Provider

Center for Space Radiations (CSR)

#### Portal Entry Point

https://swe.ssa.esa.int/csr-ept-r112-federated

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### R.113 PROBA-V/EPT Proton flux geographical maps

#### Description

The weekly averaged proton flux in each energy channel in the energy range 9.5-248 MeV as measured by the Energetic Particle Telescope (EPT) on board PROBA-V are provided as a function of geographical position.

#### Status

Ready

### Provider

Center for Space Radiations (CSR)

### Portal Entry Point

https://swe.ssa.esa.int/csr-ept-r113-federated

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## R.114 PROBA-V/EPT Helium flux geographical maps

### Description

The weekly averaged helium flux in each energy channel in the energy range 38-980 MeV as measured by the Energetic Particle Telescope (EPT) on board PROBA-V are provided as a function of geographical position.

### Status

Ready

### Provider

Center for Space Radiations (CSR)

### Portal Entry Point

https://swe.ssa.esa.int/csr-ept-r114-federated

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## R.115 PROBA-V/EPT Auroral electron energy spectrum characterisation

### Description

Energy spectrum characterization of the auroral electrons in the energy range 0.5-8 MeV based on PROBA-V/EPT measurements. Auroral electrons are selected based on McIlwain L coordinate (L>3) separately for the Southern and Northern hemisphere, and resulting fluxes averaged over a time interval of a week.

### Status

Ready

### Provider

Center for Space Radiations (CSR)

### Portal Entry Point

https://swe.ssa.esa.int/csr-ept-r115-federated

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### R.116 PROBA-V/EPT SAA proton energy spectrum characterisation

#### Description

Energy spectrum characterization of the South Atlantic Anomaly (SAA) protons in the energy range 10-248 MeV based on PROBA-V/EPT measurements. The SAA protons are selected based on McIlwain L coordinate and the Earth magnetic field intensity (1.1<L<2.1 and 0.16<B(G)<0.22), and resulting fluxes averaged over a time interval of a week. They are subdivided into two categories: night data when EPT is looking eastwards and day data when EPT is looking eastwards.

#### Status

Ready

#### Provider

Center for Space Radiations (CSR)

#### Portal Entry Point

https://swe.ssa.esa.int/csr-ept-r116-federated

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### R.117 PROBA-V/EPT SAA helium energy spectrum characterisation

#### Description

Energy spectrum characterization of the South Atlantic Anomaly (SAA) helium in the energy range 38-980 MeV based on PROBA-V/EPT measurements. The SAA helium is selected based on McIlwain L coordinate and the Earth magnetic field intensity (1.1<L<2.1 and 0.16<B(G)<0.22), and resulting fluxes averaged over a time interval of a week. They are subdivided into two categories: night data when EPT is looking eastwards and day data when EPT is looking eastwards.

#### Status

Ready

#### Provider

Center for Space Radiations (CSR)

#### Portal Entry Point

https://swe.ssa.esa.int/csr-ept-r117-federated

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### R.118 Time series of PROBA-1/SREM radiation rates

#### Description

Radiation situation reports based on data from the SREM instrument in several key regions along the orbit of the PROBA-1 spacecraft. Daily measurements are compared with reference particle rates and spectra for the proton and electron belts and the slot region.

#### Status

Ready

#### Provider

Paul Buehler (PB)

#### Portal Entry Point

https://swe.ssa.esa.int/pb-srem-federated

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### R.119 Time series of Integral/SREM radiation rates

#### Description

Radiation situation reports based on data from the SREM instrument in several key regions along the orbit of the Integral spacecraft. Daily measurements are compared with reference particle spectra for the electron belt, while comparison of rates with long term averages, as well as spectra and flux time series are provided when an SEP is detected in interplanetary space.

#### Status

Ready

#### Provider

Paul Buehler (PB)

#### Portal Entry Point

https://swe.ssa.esa.int/pb-srem-federated

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### R.120 Time series of Rosetta/SREM radiation rates

#### Description

Radiation situation reports based on data from the SREM instrument on board Rosetta. When an SEP is detected in interplanetary space, daily rates are compared with long term averages, and spectra and flux time series are provided.

**Status**

Ready

**Provider**

Paul Buehler (PB)

**Portal Entry Point**

https://swe.ssa.esa.int/pb-srem-federated

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### R.121 Time series of Herschel/SREM radiation rates

**Description**

Radiation situation reports based on data from the SREM instrument on board Herschel. When An SEP is detected at L2, daily rates are compared with long term averages, and spectra and flux time series are provided.

**Status**

Ready

**Provider**

Paul Buehler (PB)

**Portal Entry Point**

https://swe.ssa.esa.int/pb-srem-federated

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### R.122 Time series of Planck/SREM radiation rates

**Description**

Radiation situation reports based on data from the SREM instrument on board Planck. When an SEP is detected at L2, daily rates are compared with long term averages, and spectra and flux time series are provided.

**Status**

Ready

**Provider**

Paul Buehler (PB)

**Portal Entry Point**

https://swe.ssa.esa.int/pb-srem-federated

## R.123 Radiation environment outside the ISS (RADSpace)

### Description

Statistics on the accumulated depth dose distribution inside an anthropomorphic phantom outside the International Space Station from the MATROSHKA experiment MTR-1. This was achieved by applying passive thermoluminescence detectors in a 2.5 cm grid throughout the phantom. The measurement campaign ran from 26 February 2004 until 18 August 2005.

### Status

Ready

### Provider

Department Radiation Biology (DLR-IAM)

### Portal Entry Point

https://swe.ssa.esa.int/dlr-iam-r123-federated

## R.124 Radiation environment inside the ISS (RADSpace)

### Description

Count rates, dose rates and daily averaged dose rates inside the ISS.

### Status

Ready

### Provider

Department Radiation Biology (DLR-IAM)

### Portal Entry Point

https://swe.ssa.esa.int/dlr-iam-r124-federated

## R.125 Accumulated dose in human phantoms onboard the ISS (RADSpace)

### Description

Statistics on the accumulated depth dose distribution inside an anthropomorphic phantom onboard the International Space Station from the MATROSHKA experiments MTR2A and MTR-2B. This was achieved by applying passive thermoluminescence detectors in a 2.5 cm grid throughout the phantom. The measurement campaigns ran from 5 January 2006 until 7 December 2006 (MTR-2A) and from 18 October 2007 until 18 March 2009 (MTR-2B).

**Status**

Ready

**Provider**

Department Radiation Biology (DLR-IAM)

**Portal Entry Point**

https://swe.ssa.esa.int/dlr-iam-r125-federated

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## R.127 SEP Post-event analysis for aviation radiation exposure (RADSEP)

**Description**

A post event analysis of SEP events for aviation radiation exposure.

**Status**

Ready

**Provider**

Department Radiation Biology (DLR-IAM)

**Portal Entry Point**

https://swe.ssa.esa.int/dlr-iam2-federated

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## R.128 Very high-energy Solar Energetic Particle environment mission specification: proton fluence

**Description**

The very high-energy proton fluence in the near-Earth interplanetary space integrated over the mission for a user-specified mission length (0.5–7 years) and confidence level (e.g., 90, 95, 99%) in twelve differential energy channels between 10.46 and 1012.5 MeV, plus an integral channel at >1012.5 MeV.

**Status**

Ready

**Provider**

Space Research Laboratory, Department of Physics and Astronomy, University of Turku (SRL)

**Portal Entry Point**

https://swe.ssa.esa.int/utu-srl-r128-federated

## R.129 Very high-energy Solar Energetic Particle environment mission specification: proton peak flux

### Description

The very high-energy hourly and 5 minute proton peak flux in the near-Earth interplanetary space integrated over the mission for a user-specified mission length (0.5–7 years) and confidence level (e.g., 90, 95, 99%).

### Status

Ready

### Provider

Space Research Laboratory, Department of Physics and Astronomy, University of Turku (SRL)

### Portal Entry Point

https://swe.ssa.esa.int/utu-srl-r129-federated

## R.130 Solar Energetic Particle event catalogue: high-energy solar proton events

### Description

A catalogue of high-energy solar proton events based on the observations in the 55-80 MeV energy channel of the SOHO/ERNE instrument. The information per event consists of event onset time and peak flux (proton and electrons), end time (protons), event fluence in different energy channels (protons, oxygen), Fe/O ratio in several energy channels, and information on the associated X-ray flares and CMEs.

### Status

Ready

### Provider

Space Research Laboratory, Department of Physics and Astronomy, University of Turku (SRL)

### Portal Entry Point

https://swe.ssa.esa.int/utu-srl-r130-federated

## R.131 Electron population model at GEO

### Description

Empirical model of the 10 eV to 40 keV electron population at GEO (L=6-7) under different geomagnetic activity levels or solar wind velocity levels. The model is based on ESA Cluster II PEACE data from 2001-2014.

### Status

Ready

### Provider

Mullard Space Science Laboratory (MSSL)

### Portal Entry Point

https://swe.ssa.esa.int/mssl-r131-federated

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## R.132 Electron population model at MEO

### Description

Empirical model of the 10 eV to 40 keV electron population at MEO (L=4-6) under different geomagnetic activity levels or solar wind velocity levels. The model is based on ESA Cluster II PEACE data from 2001-2014.

### Status

Ready

### Provider

Mullard Space Science Laboratory (MSSL)

### Portal Entry Point

https://swe.ssa.esa.int/mssl-r132-federated

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## R.133 Electron population model at LEO

### Description

Empirical model of the 10 eV to 40 keV electron population at LEO under different geomagnetic activity levels or solar wind velocity levels. The model is based on the NASA Van Allen Probes HOPE data from 2012-2018 supplemented by data from the EFW instrument.

### Status

Ready

### Provider

Mullard Space Science Laboratory (MSSL)

### Portal Entry Point

https://swe.ssa.esa.int/mssl-r133-federated

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## R.134a SEPForecast

### Description

The SEPForecast product (R.134a) provides alerts for SEP events that have the potential to impact satellite operation, satellite tracking, human spaceflight, and aviation. The main contents of the issued alerts are estimates of the probability of an event, the magnitude of impact should the event take place, the risk level associated with the event (calculated from the probability of an event and magnitude of impact), a time window over which these estimates are considered valid. The alerts are provided for two energy thresholds, >10 MeV and >60 MeV.

### Status

Ready

### Provider

BIRA-IASB Space Weather Services ()

### Portal Entry Point

https://swe.ssa.esa.int/bira-sepforecast-federated

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## R.135 Solar Energetic Particle Environment Modelling (SEPEM)

### Description

SEPEM (Solar Energetic Particle Environment Modelling) is a WWW interface to solar energetic particle data and a range of modelling tools and functionalities intended to support space mission design. The system provides an implementation of several well known modelling methodologies, built on cleaned datasets. It also gives the user increased flexibility in his/her analysis and allows generation of mission integrated fluence statistics, peak flux statistics and other functionalities. It also integrates effects tools that calculate single event upset rates and radiation doses for a variety of scenarios.

### Status

Ready

### Provider

BIRA-IASB Space Weather Services ()

### Portal Entry Point

https://sepem-oidc.ssa-swe.eu/

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## R.136 SWIFF Plasmasphere (SPM) electron density and temperature distribution model

### Description

The SWIFF plasmaphere model (SPM) is a 3D dynamic model of the plasmasphere which calculates the number density and the temperature of the electrons inside and outside the plasmasphere. The model runs once a day using predicted Kp values providing a forecast of these parameters for the following day. Updated animations are expected to appear around 14:30 UTC at latest.

### Status

Ready

### Provider

BIRA-IASB Space Weather Services ()

### Portal Entry Point

https://swe.ssa.esa.int/bira-swiff-federated

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## R.137 DYnamic Atmospheric Shower Tracking Interactive Model Application (DYASTIMA)

### Description

DYASTIMA (DYnamic Atmospheric Shower Tracking Interactive Model Application) provides a simulation of the shower cascades generated in a planet's atmosphere due to cosmic rays. The output provides all the available information about the cascade, such as the number, the energy, the direction, the arrival time and the energy deposit of the secondary particles at different atmospheric layers. The DYASTIMA-R extension provides the radiation doses within the atmosphere by calculating the energy that is deposited in a cylindrical phantom, allows a comparison of the contribution from different particles to the total equivalent dose. The user can access a set of already calculated scenarios and can request further case studies.

### Status

Ready

### Provider

NKUA Cosmic Ray Group (ANeMoS)

### Portal Entry Point

https://swe.ssa.esa.int/dyastima-federated

## R.138 High-energy Solar Energetic Particle environment mission specification: heavy ion fluence

### Description

The high-energy heavy ion fluence in the near-Earth interplanetary space integrated over the mission for a user-specified mission length (0.5-7 years) and confidence level (e.g., 90, 95, 99%) in three differential energy channels between 13 and 100 MeV/n for He, two differential energy channels between 25 and 100 MeV/n for CNO, and one differential energy channel between 50 and 100 MeV/n for heavier ions up to Fe.

### Status

Ready

### Provider

Space Research Laboratory, Department of Physics and Astronomy, University of Turku (SRL)

### Portal Entry Point

https://swe.ssa.esa.int/utu-srl-r138-federated

## R.139 Static radiation model of energetic electrons at LEO

### Description

A static radiation model for electrons at LEO for regions covered by the high quality PROBA-V/EPT data. Eight fixed percentile levels (30, 40, 50, 60, 70, 80, 90, 95%), mean values and input original time series for each energy channel are provided in bins of B-L, as well as weekly average time series for each calendar year covered by the PROBA-V/EPT measurements. On the graphs, electron model AE8-MIN and AE8-MAX fluxes are shown for comparison.

### Status

Ready

### Provider

Center for Space Radiations (CSR)

### Portal Entry Point

https://swe.ssa.esa.int/csr-ept-r139-federated

### R.140 Static radiation model of energetic protons at LEO

#### Description

A static radiation model for protons at LEO for regions covered by the high quality PROBA-V/EPT data. Eight fixed percentile levels (30, 40, 50, 60, 70, 80, 90, 95%), mean values and input original time series for each energy channel are provided in bins of B-L, as well as weekly average time series for each calendar year covered by the PROBA-V/EPT measurements. On the graphs, proton model AP8-MIN and AP8-MAX fluxes are shown for comparison, together with information on WBK Badhwar-Konradi anisotropy factors for the given position.

#### Status

Ready

#### Provider

Center for Space Radiations (CSR)

#### Portal Entry Point

https://swe.ssa.esa.int/csr-ept-r140-federated

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### R.141 Static radiation model of energetic helium ions at LEO

#### Description

A static radiation model for helium ions at LEO for regions covered by the high quality PROBA-V/EPT data. Mean flux values and input original time series for each energy channel are provided in bins of B-L, as well as weekly average time series for each calendar year covered by the PROBA-V/EPT measurements.

#### Status

Ready

#### Provider

Center for Space Radiations (CSR)

#### Portal Entry Point

https://swe.ssa.esa.int/csr-ept-r141-federated

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### R.142 SaRIF Risk Indicator Panel

#### Description

The risk indicator panel is displayed on the front page. The risk indicators provide a high-level indication of the risk of damage to satellites due to space weather. They combine information on

the space radiation environment with effects on materials which are commonly used on satellites. Two risk indicators are provided at three representative orbits (GOES-16, GIOVE-A, Slot Region): risk of internal charging due to high energy electrons, and risk of degradation of electronic components due to dose rate and total ionising dose (TID). The archive of the risk indicators for GOES-14 and GOES-15 orbits is also available.

### Status

Ready

### Provider

British Antarctic Survey (BAS)

### Portal Entry Point

https://swe.ssa.esa.int/sarif-r142-federated

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## R.143 SaRIF GOES-16 Internal Charging Current

### Description

A time-series of internal charging current on the GOES-16 orbit from the past week, along with a 24 h forecast. The plot shows charging current penetrating 0.5 mm of aluminium shielding and deposited in Kapton. The plot shows coloured thresholds corresponding to the internal charging risk indicator displayed on the front page. An archive of past data is available by selecting the date of interest above the plot. There are two links below the plots to take the User to (1) a proton spectrum plot representing differential proton flux for a range of different energies in the GOES-16 environment, and (2) two 24h forecast plots: one of differential and the other of integral electron flux for a range of different energies in the GOES-16 environment. An archive of the internal charging current on the GOES-15 orbit is also provided.

### Status

Ready

### Provider

British Antarctic Survey (BAS)

### Portal Entry Point

https://swe.ssa.esa.int/sarif-r143-federated

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## R.144 SaRIF GOES-16 Total Ionising Dose and Dose Rate

### Description

The TID product at GOES-16 displays two plots, (1) a time-series of TID in the GOES-16 environment, and (2) a time-series of dose rate in the GOES-16 environment. Both plots show

data from the past week and a 24-h forecast. The dose rate plot shows the thresholds, which correspond to the GOES-16 TID risk indicator on the front page. An archive of past data is available by selecting the date of interest from above the plots. An archive of the total ionising dose and dose rate on the GOES-15 orbit is also provided.

### Status

Ready

### Provider

British Antarctic Survey (BAS)

### Portal Entry Point

https://swe.ssa.esa.int/sarif-r144-federated

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## R.145 SaRIF GOES-16 Radiation Environment

### Description

This is a multi-plot product consisting of six time-series from the past week. A 24-h forecast is provided for three of the plots. The first two plots represent the GOES-16 environment. The multi-plot time-series displayed are: BAS-RBM >2 MeV electron flux from 2-7 L*, with a 24 h forecast, BAS-RBM modelled and satellite observed (where available) >2 MeV electron flux at the representative satellite orbit, with 24 h model forecast; Kp, with 24 h forecast; IMF Bz and solar wind (SW) velocity measured by DSCOVR/ACE; Dst and SW pressure measured by DSCOVR/ACE; >10 MeV proton flux measured by DSCOVR/ACE. Separate web pages show the electron flux as a function of time and L* at four selected energies (800 keV, 2 MeV, >800 keV and >2 MeV). An archive of past data is available by selecting the date of interest from above the plots.

### Status

Ready

### Provider

British Antarctic Survey (BAS)

### Portal Entry Point

https://swe.ssa.esa.int/sarif-r145-federated

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## R.146 SaRIF GOES-14 Internal Charging Current

### Description

A combined nowcast and forecast for the charging current behind 0.5mm of aluminium shielding at the GOES-14 location in graphical form. Calculated by DICTAT using data from GOES-14. The

background of the plot is coloured to denote the risk level – the same charging current thresholds are used to colour the corresponding entry in the risk indicator panel.

### Status

Ready

### Provider

British Antarctic Survey (BAS)

### Portal Entry Point

https://swe.ssa.esa.int/sarif-r146-federated

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## R.147 SaRIF GOES-14 Total Ionising Dose and Dose Rate

### Description

A combined nowcast and forecast for the total ionising dose and dose rate due to electron, proton and Bremsstrahlung radiation behind 2 mm of aluminium shielding at the GOES-14 location. Calculated by SHIELDOSE using GOES-14 data. 2 panels are shown: the dose rate and the total dose accumulated since the system began operating. Each panel displays data for the last week. A separate page, available via a link, shows the most recent proton and electron spectra at the spacecraft location. The background of the dose rate plot is colour coded to denote the risk level – the same dose rate thresholds are used to colour the corresponding entry in the risk indicator panel.

### Status

Ready

### Provider

British Antarctic Survey (BAS)

### Portal Entry Point

https://swe.ssa.esa.int/sarif-r147-federated

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## R.148 SaRIF GOES-14 Radiation Environment

### Description

A combined nowcast and forecast for the outer radiation belt from 2-7 L* in graphical form calculated by the BAS-RBM. Separate pages show the electron flux as a function of time and L* at 4 selected energies (800 keV, 2 MeV, >800 keV and >2MeV). On each page the location of GOES-14 and the position of the magnetopause are indicated. The modelled electron flux at the location of GOES-14 is shown on a separate panel, along with the measured GOES-14 flux where available.

Further plots show GOES-14 >10 MeV proton flux, the solar wind speed and pressure and IMF Bz as measured by the DSCOVR spacecraft and the KP and Dst indices.

### Status

Ready

### Provider

British Antarctic Survey (BAS)

### Portal Entry Point

https://swe.ssa.esa.int/sarif-r148-federated

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## R.149 SaRIF GIOVE-A Internal Charging Current

### Description

A time-series of internal charging current on the GIOVE-A orbit from the past week, along with a 24 h forecast. The plot shows charging current penetrating 0.5 mm of aluminium shielding and deposited in Kapton. The plot shows coloured thresholds corresponding to the internal charging risk indicator displayed on the front page. An archive of past data is available by selecting the date of interest above the plot. There are two links below the plots to take the User to (1) a proton spectrum plot representing differential proton flux for a range of different energies in the GIOVE-A environment, and (2) two forecast plots, one of differential electron flux and the other of integral electron flux for a range of different energies in the GIOVE-A environment.

### Status

Ready

### Provider

British Antarctic Survey (BAS)

### Portal Entry Point

https://swe.ssa.esa.int/sarif-r149-federated

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## R.150 SaRIF GIOVE-A Total Ionising Dose and Dose Rate

### Description

The TID product at GIOVE-A displays two plots, (1) a time-series of TID in the GIOVE-A environment, and (2) a time-series of dose rate in the GIOVE-A environment. Both plots show data from the past week and a 24 h forecast. The dose rate plot shows the thresholds which correspond to the GIOVE-A TID risk indicator on the front page. An archive of past data is available by selecting the date of interest from above the plots.

### Status

Ready

### Provider

British Antarctic Survey (BAS)

### Portal Entry Point

https://swe.ssa.esa.int/sarif-r150-federated

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## R.151 SaRIF GIOVE-A Radiation Environment

### Description

A combined nowcast and forecast for the outer radiation belt from 2-7 L* in graphical form calculated by the BAS-RBM. Separate pages show the electron flux as a function of time and L* at 4 selected energies (800 keV, 2 MeV, >800 keV and >2MeV). On each page the location of GIOVE-A and the position of the magnetopause are indicated. Charging currents from the SURF instrument on GIOVE-A are shown in a separate panel. Further plots show GOES 10 MeV proton flux, the solar wind speed and pressure and IMF Bz as measured by the DSCOVR spacecraft and the KP and Dst indices.

### Status

Ready

### Provider

British Antarctic Survey (BAS)

### Portal Entry Point

https://swe.ssa.esa.int/sarif-r151-federated

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## R.152 SaRIF Slot Region Internal Charging Current

### Description

A combined nowcast and forecast for the charging current behind 0.5mm of aluminium shielding for a spacecraft in an equatorial orbit at 8000km altitude ( L* ~ 2.2) in graphical form. Calculated by DICTAT using results from the BAS-RBM. The background of the plot is coloured to denote the risk level – the same charging current thresholds are used to colour the corresponding entry in the risk indicator panel.

### Status

Ready

### Provider

British Antarctic Survey (BAS)

### Portal Entry Point

https://swe.ssa.esa.int/sarif-r152-federated

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## R.153 SaRIF Slot Region Total Ionising Dose and Dose Rate

### Description

A combined nowcast and forecast for the total ionising dose and dose rate due to electron, proton and Bremsstrahlung radiation behind 2 mm of aluminium shielding for an equatorial slot region orbit at 8000km altitude. Calculated by SHIELDOSE using results from the BAS-RBM. 2 panels are shown: the dose rate and the total dose accumulated since the system began operating. Each panel displays data for the last week. A separate page, available via a link, shows the most recent proton and electron spectra at the spacecraft location The background of the dose rate plot is colour coded to denote the risk level – the same dose rate thresholds are used to colour the corresponding entry in the risk indicator panel.

### Status

Ready

### Provider

British Antarctic Survey (BAS)

### Portal Entry Point

https://swe.ssa.esa.int/sarif-r153-federated

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## R.154 SaRIF Slot Region Radiation Environment

### Description

A combined nowcast and forecast for the outer radiation belt from 2-7 L* in graphical form calculated by the BAS-RBM. Separate pages show the electron flux as a function of time and L* at 4 selected energies (800 keV, 2 MeV, >800 keV and >2MeV), with the location of the slot region orbit (equatorial, 8000km) and the position of the magnetopause indicated. A second panel shows the flux for the selected energy from the Van Allen probes (VAP) spacecraft. Further plots show the VAP 20 MeV proton flux, the solar wind speed and pressure and IMF Bz as measured by the DSCOVR spacecraft and the KP and Dst indices.

### Status

Ready

### Provider

British Antarctic Survey (BAS)

### Portal Entry Point

https://swe.ssa.esa.int/sarif-r154-federated

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## R.155 MOSWOC high energy electron forecast for geostationary orbit

### Description

The MOSWOC forecast product is the output from the Relativistic Electron Forecast Model (REFM) run at the Met Office. The REFM plot is the >2 MeV daily-averaged electron fluence at GEO predicted by REFM shown for the last approximately 30 days with a 3 day forecast. GOES observations from the previous 30 days are over-plotted. REFM is run at the Met Office every 3 h. An archive of past data is available by selecting the date of interest from above the plots.

### Status

Ready

### Provider

British Antarctic Survey (BAS)

### Portal Entry Point

https://swe.ssa.esa.int/sarif-r155-federated

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## R.156 MOSWOC Forecaster Summary

### Description

A text-based assessment of the likely high energy electron environment, based on available observations and model forecasts, produced by the forecasters at MOSWOC and updated twice daily at midnight and midday. The forecaster comments on the high-energy electron flux and fluence over the next 4 days.

### Status

Ready

### Provider

British Antarctic Survey (BAS)

### Portal Entry Point

https://swe.ssa.esa.int/sarif-r156-federated

## R.157 SaRIF Best Reconstruction of the Radiation Environment

### Description

The BAS-RBM forecasts are produced with the best available data at the time. Some of the input parameters, such as the Kp index, are usually updated after the event, which can affect the simulations. The BAS-RBM is therefore run once every week (early on the Monday morning) for the week starting 2 weeks before the current date, making use of the updated information to provide the best reconstruction of the radiation environment. The web page shows the same format of multi-plots as BAS Radiation Environment forecast for the same energy ranges, but reconstructed from the latest observation data. Each simulation shows a week (starting and ending at midnight on Saturday). The latest reconstruction is displayed by default and other dates can be selected from the bar at the top of the web page.

### Status

Ready

### Provider

British Antarctic Survey (BAS)

### Portal Entry Point

https://swe.ssa.esa.int/sarif-r157-federated

## R.158 HESPERIA RELeASE

### Description

The High Energy Solar Particle Events foRecastIng and Analysis Relativistic Electron Alert System for Exploration (HESPERIA REleASE) model uses the fact that near relativistic electrons (1 MeV electrons travel at 95% of the speed of light) travel faster than ions (30 MeV protons travel at 25% of the speed of light) to predict the proton flux by using the actual electron flux and the increase of the electron flux in the last 30, 60, or 90 minutes. The HESPERIA REleASE model produces two forecasts: one based on inputs from SOHO/EPHIN and one based on ACE/EPAM electron data for two proton energy channels 15.8-39.8 MeV and 28.2-50.1 MeV. Forecasts are produced with a lead time of 30, 60, and 90 minutes.

### Status

Ready

### Provider

Institute for Astronomy, Astrophysics, Space Applications & Remote Sensing (IAASARS)

### Portal Entry Point

https://swe.ssa.esa.int/noa-hesperia-r158-federated

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## R.159 HESPERIA UMASEP-500

### Description

The High Energy Solar Particle Events foRecastIng and Analysis (HESPERIA) UMASEP-500 model makes a lag-correlation of solar electromagnetic flux with the particle flux at near-earth. If the correlation is high, the model infers that there is a magnetic connection through which particles are arriving. If, additionally, the intensity of the flux of the associated solar event is also high, then the HESPERIA UMASEP-500 scheme issues a > 500 MeV SEP prediction.

### Status

Ready

### Provider

Institute for Astronomy, Astrophysics, Space Applications & Remote Sensing (IAASARS)

### Portal Entry Point

https://swe.ssa.esa.int/noa-hesperia-r159-federated

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## R.160 PROBA-V/EPT High-latitude/polar electron flux survey

### Description

Time series of electron integral flux in the energy ranges >0.5, >1 and > 2 MeV as measured by the Energetic Particle Telescope (EPT) on board PROBA-V for McIlwain L coordinates 3<L<5 covering the outer radiation belt (path averaged fluxes).

### Status

Ready

### Provider

Center for Space Radiations (CSR)

### Portal Entry Point

https://swe.ssa.esa.int/csr-ept-r160-federated

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### R.161 PROBA-V/EPT High-latitude/polar proton flux survey

#### Description

Time series of proton integral flux in the energy ranges >10, >50 and > 100 MeV as measured by the Energetic Particle Telescope (EPT) on board PROBA-V for McIlwain L coordinates L>6 covering the polar regions (path averaged fluxes).

#### Status

Ready

#### Provider

Center for Space Radiations (CSR)

#### Portal Entry Point

https://swe.ssa.esa.int/csr-ept-r161-federated

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### R.162 PROBA-V/EPT High-latitude/polar helium flux survey

#### Description

Time series of helium integral flux in the energy ranges >10, >50 and > 100 MeV/n as measured by the Energetic Particle Telescope (EPT) on board PROBA-V for McIlwain L coordinates L>6 covering the polar regions (path averaged fluxes).

#### Status

Ready

#### Provider

Center for Space Radiations (CSR)

#### Portal Entry Point

https://swe.ssa.esa.int/csr-ept-r162-federated

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### R.163 HESPERIA RELeASE Alert

#### Description

A notification system based on the forecasts from HESPERIA RELeASE that informs about the expected radiation impact in real-time using an ilustration and a distribution system for registered users.

#### Status

Ready

### Provider

Institute for Astronomy, Astrophysics, Space Applications & Remote Sensing (IAASARS)

### Portal Entry Point

https://swe.ssa.esa.int/noa-hesperia-r163-federated

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## R.165 High-energy Solar Energetic Particle environment mission specification: heavy ion peak flux

### Description

The high-energy heavy ion flux probability distribution in the near-Earth interplanetary space integrated over the mission for a user-specified mission length (0.5-7 years) in three differential energy channels between 13 and 100 MeV/n for He, two differential energy channels between 25 and 100 MeV/n for CNO, and one differential energy channel between 50 and 100 MeV/n for heavier ions up to Fe.

### Status

Ready

### Provider

Space Research Laboratory, Department of Physics and Astronomy, University of Turku (SRL)

### Portal Entry Point

https://swe.ssa.esa.int/utu-srl-r165-federated

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## R.166 Very high-energy solar proton event database

### Description

A database of very high energy (>330 MeV) solar proton events observed during solar cycles 22-24 (1986-2019). Provides proton fluence and peak flux spectra for all events observed during the period, and temporal evolution at 5-minute resolution of the flux spectra for several well-observed Ground Level Enhancements (GLEs).

### Status

Ready

### Provider

Space Research Laboratory, Department of Physics and Astronomy, University of Turku (SRL)

### Portal Entry Point

https://swe.ssa.esa.int/utu-srl-r166-federated

## R.167 PROBA-V/EPT Total ionizing dose estimation at LEO

### Description

Time series of daily total ionizing dose (TID) estimation and its contributions from electrons, protons, and helium ions behind 2mm Al shielding for spherical geometry, based on measurements of PROBA-V/EPT. The data are grouped in monthly files. Levels for anomalously quick dose accumulation are also defined.

### Status

Ready

### Provider

Center for Space Radiations (CSR)

### Portal Entry Point

https://swe.ssa.esa.int/csr-ept-r167-federated

## R.168 PROBA-V/EPT Total non-ionizing dose estimation at LEO

### Description

Time series of daily total non-ionizing dose (TNID) estimation and its contributions from electrons, protons, and helium ions behind 2mm Al shielding for spherical geometry, based on measurements of PROBA-V/EPT. The data are grouped in monthly files. Levels for anomalously quick dose accumulation are also defined.

### Status

Ready

### Provider

Center for Space Radiations (CSR)

### Portal Entry Point

https://swe.ssa.esa.int/csr-ept-r168-federated

## R.170 EDRS-C/NGRM L2 Electron differential fluxes

### Description

Level 2 high energy electron flux measurements (differential and integral) at GEO from EDRS-C/NGRM. The latest 6 hours and the latest 14 days data are provided as JSON files and archived

measurements as daily CDF files. The interactive plot of the latest 14 days electron differential flux measurements is updated in near-real-time.

### Status

Ready

### Provider

Space Applications & Research Consultancy (SPARC)

### Portal Entry Point

https://swe.ssa.esa.int/sparc-geo-ngrm-r170-federated

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## R.171 EDRS-C/NGRM L2 Proton differential fluxes

### Description

Level 2 high energy proton differential flux measurements at GEO from EDRS-C/NGRM. The latest 6 hours and the latest 14 days data are provided as JSON files and archived measurements as daily CDF files. The interactive plot of the latest 14 days measurements is updated in near-real-time.

### Status

Ready

### Provider

Space Applications & Research Consultancy (SPARC)

### Portal Entry Point

https://swe.ssa.esa.int/sparc-geo-ngrm-r171-federated

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## R.172 GEO electron integral flux alerts

### Description

Nowcasting alerts for GEO radiation belt electron flux. E-mail alerts are provided to registered users when running daily averaged NGRM electron integral fluxes exceed user-defined thresholds for selected energies.

### Status

Ready

### Provider

Space Applications & Research Consultancy (SPARC)

### Portal Entry Point

https://swe.ssa.esa.int/sparc-geo-ngrm-r172-federated

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## R.173 GEO proton flux alerts

### Description

Nowcasting alerts for solar proton fluxes at GEO. E-mail alerts are provided to registered users when NGRM proton differential fluxes exceed user-defined thresholds.

### Status

Ready

### Provider

Space Applications & Research Consultancy (SPARC)

### Portal Entry Point

https://swe.ssa.esa.int/sparc-geo-ngrm-r173-federated

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## R.174 EDRS-C/NGRM Electron daily fluences

### Description

Level 2 daily averaged high energy electron integral flux measurements at GEO from EDRS-C/NGRM. The latest 6 hours and the latest 14 days data are provided as JSON files. Interactive plots of the latest 14 days are provided. Data of the last day correspond to the last 24 hours and are updated in near-real-time.

### Status

Ready

### Provider

Space Applications & Research Consultancy (SPARC)

### Portal Entry Point

https://swe.ssa.esa.int/sparc-geo-ngrm-r174-federated

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## R.175 GEO Multiple electron flux measurements

### Description

Display of the latest electron differential flux measurements at GEO from EDRS-C/NGRM, GOES-19/MPS-Hi and Himawari-8/SEDA for E =1 MeV for the past 24 hours in UTC and MLT.

### Status

Ready

### Provider

Space Applications & Research Consultancy (SPARC)

### Portal Entry Point

https://swe.ssa.esa.int/sparc-geo-ngrm-r175-federated

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## R.176 RB-IND Radiation belt activity index for solar array degradation

### Description

The index called R Ratio gives the risk of solar array degradation taking into account an initial specification based on the reference model AP8 Min. This R ratio is the ratio between 4 MeV proton fluences measured by in-situ measurements and derived from AP8 model on a given orbit. This index is available from 2010 to now for 4 orbits: GTO to GEO, LEO to MEO, LEO to GEO and a circular orbit at 8000km.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Space Radiative Environment Research Group (ERS)

### Portal Entry Point

https://swe.ssa.esa.int/onera-rb-ind-federated

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## R.177 RB-IND Radiation belt activity indices for surface and internal charging

### Description

This product contains two indices: Ca4 and Ca8 linked to surface charging and internal charging respectively. These indices give the risk of surface and internal charging for any mission in the magnetosphere. These indices are available from 1950 to now.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Space Radiative Environment Research Group (ERS)

### Portal Entry Point

https://swe.ssa.esa.int/onera-rb-ind-federated

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## R.178 Internal charging environment and analysis report

### Description

For the measured and forecasted electron environment at GEO, a charging analysis report is provided including the computed maximum electric field, surface voltage potential and charging current for various geometry and material configurations. The report also gives mitigation steps in case there is a risk for ESD. The results are obtained from daily runs through the Virtual Space Weather Modelling Centre.

### Status

Product provided for demonstration, not assigned to service.

### Provider

BIRA-IASB Space Weather Services ()

### Portal Entry Point

https://swe.ssa.esa.int/bira-icea-r178-federated

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## R.179 Internal charging environment nowcast

### Description

Observed GOES-19 high energy electron fluxes at GEO provide an appropriate severe internal charging environment for use in internal charging assessment that could have been experienced in the recent past. The observed electron environment of the past day is used to run DICTAT to provide a nowcast of the maximum electric field, surface potential and charging current for various dielectric material and shielding configurations. The results are obtained from daily runs through the Virtual Space Weather Modelling Centre.

### Status

Product provided for demonstration, not assigned to service.

### Provider

BIRA-IASB Space Weather Services ()

### Portal Entry Point

https://swe.ssa.esa.int/bira-icea-r179-federated

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### R.180 Internal charging environment forecast

#### Description

The Sheffield NARMAX model is used to predict the expected high energy electron fluxes at GEO up to 3 days ahead to provide an appropriate severe internal charging environment for use in internal charging assessment that could be experienced in the near future. The predicted electron environment is used to run DICTAT to provide a 3 day forecast of the maximum electric field, surface potential and charging current for various geometry and material configurations. The results are obtained from daily runs through the Virtual Space Weather Modelling Centre.

#### Status

Product provided for demonstration, not assigned to service.

#### Provider

BIRA-IASB Space Weather Services ()

#### Portal Entry Point

https://swe.ssa.esa.int/bira-icea-r180-federated

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### R.201 Space Radiation Application for Spacecraft Operators (SRASO)

#### Description

SRASO allows spacecraft operators to monitor, forecast and report space weather environment conditions and their possible influence on spacecraft. To achieve this goal, the application provides access to rich repositories for space weather information and spacecraft data and active support for correlating related datasets.

#### Status

Product provided for demonstration, not assigned to service.

#### Supporting facility

SWE Data Centre (SWE Portal)

#### Portal Entry Point

https://sraso.swe.s2p.esa.int/

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### R.211 RB-FAN Radiation Belts Orbits dedicated Risk Alert

#### Description

The RB-FAN Radiation Belts Orbits dedicated Risk Alert is displayed on the landing page using an overview table. The alerts are designed to provide a high-level indication of the daily risk that a

spacecraft may encounter over a given time period, from yesterday to 3 days ahead, for different orbits (GEO, GNSS,LEO and a user-predefined orbit). The indicator of orbit dedicated risks is based on the combination of the estimation of two specific damaging effects on spacecraft: Deep Charging and Solar Cells degradation. The individual specific risk indicators for effects on spacecraft can be accessed by clicking in the desired box of the Orbit dedicated risks table. A one-month history of these alerts is also provided at the bottom of the landing page. A longer term archive is also available upon request.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Space Radiative Environment Research Group (ERS)

### Portal Entry Point

https://swe.ssa.esa.int/onera-rb-fan-federated

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## R.212 RB-FAN Radiation Belts Deep Charging Risk Alert

### Description

The RB-FAN Radiation Belts Deep Charging Risk Alert consists of the estimation of the daily maximum spacecraft electric potential using a gauge style widget and is displayed on the Risk Pages. It provides the value of the day as well as the tendency (based on previous day). This product provides this high-level indication of deep charging risk for a given orbit and a given day. It is reachable from the landing page as well as from the drop-down menu in the upper left corner named RB-FAN. A one-month history of these alerts is also provided at the bottom of the Risk pages. A longer term archive is also available upon request.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Space Radiative Environment Research Group (ERS)

### Portal Entry Point

https://swe.ssa.esa.int/onera-rb-fan-federated

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## R.213 RB-FAN Radiation Belts Solar Cell, SEE and Human Spaceflight Risk Alert

### Description

The RB-FAN Radiation Belts Solar Cell, SEE and Human Spaceflight Risk Alert consists of the estimation of the daily value of the R-index using a gauge style widget and is displayed on the

Risk Pages. This estimation is done for several energies (4MeV, 10MeV, 50MeV and 100MeV). It provides the value of the day as well as the tendency (based on previous day). This product provides this high-level indication of solar cell degradation, single events effects and risks to Human spaceflight safety enhancement for a given orbit and a given day. It is reachable from the landing page as well as from the sitemap. A one-month history of these alerts is also provided at the bottom of the Risk pages. Longer term archives are also available upon request.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Space Radiative Environment Research Group (ERS)

### Portal Entry Point

https://swe.ssa.esa.int/onera-rb-fan-federated

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## R.214 RB-FAN Radiation Belts Satellite Internal Electric Potential

### Description

The RB-FAN Radiation Belts Satellite Internal Electric Potential product consists of a plot of the time evolution of the spacecraft electric potential from previous day to 3 days ahead for a given orbit and is displayed on the Expert Pages. It is reachable from the Risk pages as well as from the drop-down menu in the upper left corner named RB-FAN. A one-month history is available as well as an archive.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Space Radiative Environment Research Group (ERS)

### Portal Entry Point

https://swe.ssa.esa.int/onera-rb-fan-federated

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## R.215 RB-FAN Radiation Belts Solar Cell, SEE and Human Spaceflight R indexes

### Description

The RB-FAN Radiation Belts Solar Cell Degradation, SEE and Human Spaceflight R indexes product consist in a plot of the time evolution of the daily R index from previous day to 3 days ahead for a given orbit and is displayed on the Expert Pages. It is reachable from the Risk pages as well as from the sitemap. This computation is done for several energies (4MeV, 10MeV, 50MeV and 100MeV). A one-month history is available as well as archives.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Space Radiative Environment Research Group (ERS)

### Portal Entry Point

https://swe.ssa.esa.int/onera-rb-fan-federated

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## R.216 RB-FAN Omnidirectional Differential Electron Flux

### Description

The RB-FAN Omnidirectional Differential Electron Flux (FEDO) product consists of a plot of the time evolution of the FEDO from previous day to 3 days ahead for a given orbit. It is a multi-plot providing different energy channels from a few hundreds of keV to a few MeV, combined with support information such as Kp index time evolution and with support information on the Internal Electric Potential. It is displayed on the Expert Pages and is reachable from the Risk pages as well as from the drop-down menu in the upper left corner named RB-FAN. A one-month history is available as well as an archive.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Space Radiative Environment Research Group (ERS)

### Portal Entry Point

https://swe.ssa.esa.int/onera-rb-fan-federated

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## R.217 RB-FAN Omnidirectional Differential Proton Flux

### Description

The RB-FAN Omnidirectional Differential Proton Flux (FPDO) product consists of a plot of the time evolution of the FPDO from previous day to 3 days ahead for a given orbit. It is a multi-plot providing different energy channels from a few MeV to several hundreds of MeV, combined with support information such as Kp index time evolution. It is displayed on the Expert Pages and is reachable from the Risk pages as well as from the drop-down menu in the upper left corner named RB-FAN. A one-month history is available as well as an archive.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Space Radiative Environment Research Group (ERS)

### Portal Entry Point

https://swe.ssa.esa.int/onera-rb-fan-federated

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## R.218 RB-FAN Radiation Belts Quicklook Visualisations

### Description

The RB-FAN Radiation Belts Quicklook Visualisations consists of several general plots focusing on the global time evolution of the radiation belts (protons and electrons) from previous day to 3 days ahead. This composite product is displayed partly on the landing page and on a dedicated webpage, reachable from the landing page as a shortcut in the upper panel, and from the drop-down menu in the upper left corner named RB-FAN. It provides a set of quick looks of the dynamics of the radiation belts: animations of the dynamics of the radiation belts over the time period, South Atlantic Anomaly map for a given altitude and L versus time mappings in the equator for both Omnidirectional electron and proton fluxes (several energies proposed). A one-month history is available as well as an archive.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Space Radiative Environment Research Group (ERS)

### Portal Entry Point

https://swe.ssa.esa.int/onera-rb-fan-federated

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## R.219 RB-FAN Radiation Belts Modular Bulletin

### Description

The RB-FAN Radiation Belts Modular Bulletin provides the user a simple status of the current radiation belts risks, directly in his/her mailbox. It details the Orbits dedicated risk in an understandable manner and offers the possibility to connect to the website if the end-user needs more information. It is not displayed on the website but configurable in the Config page.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Space Radiative Environment Research Group (ERS)

### Portal Entry Point

https://swe.ssa.esa.int/onera-rb-fan-federated

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## R.221 Plasma density measurements (PLASMA)

### Description

Electron and plasma mass density (equatorial and field aligned) derived from ground-based VLF (whistler) and magnetometer (FLR) measurements.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Eötvös Loránd University (ELTE)

### Portal Entry Point

https://swe.ssa.esa.int/elte-plasma-federated

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## R.222 Plasmapause Location Limits measurements (PLASMA)

### Description

Plasmapause inner and outer location limits derived from groundbased VLF (whistler) and magnetometer (FLR) measurements.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Eötvös Loránd University (ELTE)

### Portal Entry Point

https://swe.ssa.esa.int/elte-plasma-federated

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## R.223 Empirical Plasmapause Maps/plasmapause limits (PLASMA)

### Description

2D Plasmapause maps. PPM is derived by implementing a neural-network-based empirical 3D model (EPPM) of the plasmapause.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Eötvös Loránd University (ELTE)

### Portal Entry Point

https://swe.ssa.esa.int/elte-plasma-federated

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## R.224 Plasmasphere Index (PLASMA)

### Description

The calculation of PSI is based on the time series of the midnight PP position (Lpp0) derived from PPM maps. The four latest observations of Lpp0 are averaged and compared to the average calculated in the same way 30 min earlier to calculate the hourly rate of change (dLpp0/dt).

### Status

Product provided for demonstration, not assigned to service.

### Provider

Eötvös Loránd University (ELTE)

### Portal Entry Point

https://swe.ssa.esa.int/elte-plasma-federated

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## R.225 Midnight Plasmapause Proxy (PLASMA)

### Description

Midnight Plasmapause proxy is derived from the magnetic and plasma observation of the low-Earth orbiting Swarm satellites.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Eötvös Loránd University (ELTE)

### Portal Entry Point

https://swe.ssa.esa.int/elte-plasma-federated

### R.226 2-D Electron Density Maps (PLASMA)

#### Description

2D electron density map of the equatorial plasmasphere is based on a 3D empirical (neural-network-based) model (EPDM) of the plasmasphere trained on in-situ electron density observations of magnetospheric missions (Akebono,RBSP, Arase) from the period 1989 to 2019. The training set includes quiet and disturbed (even some extremely disturbed) periods, and covers the L- range: 1.5-7.5. EPDM visualisation exists in two versions, both are driven by the time history of magnetic and solar indices.

#### Status

Product provided for demonstration, not assigned to service.

#### Provider

Eötvös Loránd University (ELTE)

#### Portal Entry Point

https://swe.ssa.esa.int/elte-plasma-federated

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### R.231 RB-FAN Surface Charging No Risk Indicator

#### Description

The RB-FAN Surface Charging No Risk Indicator provides the percent of time a day an orbit is inside the plasmasphere, relying on the PLASMA product (R.223 - Empirical Plasmapause Maps/plasmapause limits). This daily indicator is provided using a gauge style widget and is displayed on the Risk Pages. The longer the spacecraft remains inside the plasmasphere during a day, the lower the risk of surface charging. The threshold between risk and no risk is configurable by the end-user. A one-month history of these alerts is also provided at the bottom of the Risk pages. Longer term archives are also available upon request.

#### Status

Product provided for demonstration, not assigned to service.

#### Provider

Space Radiative Environment Research Group (ERS)

#### Portal Entry Point

https://swe.ssa.esa.int/onera-rb-fan-federated

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### R.232 RB-FAN Surface Charging No Risk Time Series

#### Description

The RB-FAN Surface Charging No Risk Time Series provides the daily evolution of the "RB-FAN Surface Charging No Risk Indicator" in the Charging expert page, from previous day to 3 days ahead for a given orbit. A one-month history is available as well as archives.

#### Status

Product provided for demonstration, not assigned to service.

#### Provider

Space Radiative Environment Research Group (ERS)

#### Portal Entry Point

https://swe.ssa.esa.int/onera-rb-fan-federated

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### R.233 RB-FAN SEP 24h Risk Alert

#### Description

The RB-FAN SEP 24h Risk Alert provides an alert of potential SEP reaching Earth in the next 24h, with an indication of its expected strength (orbit independent, and taking into account energies greater than a few MeV). The alert consists of an estimation of the strength (3 classes) of the event and its probability of geo-effectiveness. Once the event has effectively reached Earth the forecast of its evolution is also provided. A one-month history of these alerts is also provided at the bottom of the Risk pages. Longer term archives are also available upon request.

#### Status

Product provided for demonstration, not assigned to service.

#### Provider

Space Radiative Environment Research Group (ERS)

#### Portal Entry Point

https://swe.ssa.esa.int/onera-rb-fan-federated

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### R.234 RB-FAN SEP Total Fluence Forecast

#### Description

The RB-FAN SEP Total Fluence Forecast provides the predicted total fluence of an ongoing SEP event (orbit independent) for energies between 6 MeV and 240 MeV (SEPEM energy range). This quantity is updated every 15 min as new measurements are made available. No total fluence

forecast is provided as long as no SEP event has reached Earth. This specific product is useful for the user to estimate the current risk and anticipate future risk on their s/c.

**Status**

Product provided for demonstration, not assigned to service.

**Provider**

Space Radiative Environment Research Group (ERS)

**Portal Entry Point**

https://swe.ssa.esa.int/onera-rb-fan-federated

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## 1.4. Ionospheric weather products

### I.101b Near-real-time map of the Total Electron Content (TEC) for the European region

**Description**

DLR's TEC maps for the European region provide information about vertical TEC (VTEC) derived from groundbased GNSS measurements with a latency of not more than 5 minutes and an update rate of 5 minutes. The maps cover the region between 30°N –72°N and 30°W –50°E with 1° in latitude and 1° in longitude spatial resolution.

**Status**

Ready

**Provider**

German Aerospace Center (DLR)

**Portal Entry Point**

https://swe.ssa.esa.int/impc-i101b-federated

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### I.102b Forecast of the Total Electron Content (TEC) for the European region.

**Description**

DLR's forecast TEC maps for Europe provide information about the vertical TEC (VTEC) one and three hours ahead with a latency of not more than 5 minutes and an update rate of 5 minutes. The maps cover the European region between 30°N – 72°N and 30°W – 50°E with 1° in latitudes and 1° in longitude spatial resolution. The one hour forecast is calculated as a sum of the actual European TEC map and a weighted sum of the temporal TEC gradient of the previous hour and the temporal gradient of the previous day at the same time.

### Status

Ready

### Provider

German Aerospace Center (DLR)

### Portal Entry Point

https://swe.ssa.esa.int/impc-i102b-federated

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## I.103b Near-real-time global map of the Total Electron Content (TEC)

### Description

DLR's global TEC maps provide information about vertical TEC (VTEC) derived from groundbased GNSS measurements with a latency of not more than 5 minutes and an update rate of 5 minutes. The maps provide a resolution of 2.5° in latitude and 5° in longitude spatial resolution.

### Status

Ready

### Provider

German Aerospace Center (DLR)

### Portal Entry Point

https://swe.ssa.esa.int/impc-i103b-federated

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## I.104b Forecast of the Total Electron Content (TEC) worldwide.

### Description

DLR's forecast global TEC maps provide information about the vertical TEC (VTEC) one and three hours ahead with a latency of not more than 5 minutes and an update rate of 5 minutes. The maps have a global coverage with 2.5° in latitudes and 5° in longitude spatial resolution. The one hour forecast is calculated as a sum of the actual global TEC map and a weighted sum of the temporal TEC gradient of the previous hour and the temporal gradient of the previous day at the same time.

### Status

Ready

### Provider

German Aerospace Center (DLR)

### Portal Entry Point

https://swe.ssa.esa.int/impc-i104b-federated

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## I.105a Equivalent slab thickness for Juliusruh

### Description

The equivalent slab thickness is a measure of the width of the shape of the vertical electron density profile of the ionosphere. The equivalent slab thickness is defined by the ratio of the total electron content (TEC) and the peak electron density of the local ionosphere. To compute the peak electron density, vertical sounding data from the Juliusruh ionosonde stations is used. The corresponding TEC data are extracted from the TEC maps.

### Status

Ready

### Provider

German Aerospace Center (DLR)

### Portal Entry Point

https://swe.ssa.esa.int/impc-i105a-federated

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## I.105b Equivalent slab thickness for Pruhonice

### Description

The equivalent slab thickness is a measure of the width of the shape of the vertical electron density profile of the ionosphere. The equivalent slab thickness is defined by the ratio of the total electron content (TEC) and the peak electron density of the local ionosphere. To compute the peak electron density, vertical sounding data from the Pruhonice ionosonde stations is used. The corresponding TEC data are extracted from the TEC maps.

### Status

Ready

### Provider

German Aerospace Center (DLR)

### Portal Entry Point

https://swe.ssa.esa.int/impc-i105b-federated

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## I.106 Global Scintillation Indices

### Description

The product provides an interactive geographic map and time series chart that show the latest amplitude and phase scintillation indices S4 and σφ continuously observed at globally distributed high-rate GNSS receivers operated by the German Aerospace Center (DLR) in Germany and the Istituto Nazionale di Geofisica e Vulcanologia (INGV) in Italy.

### Status

Ready

### Provider

German Aerospace Center (DLR)

### Portal Entry Point

https://swe.ssa.esa.int/impc-i106-federated

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## I.107 VTEC maps (Northern Europe)

### Description

Most recent map of VTEC.

### Status

Ready

### Provider

Norwegian Mapping Authority (NMA)

### Portal Entry Point

https://swe.ssa.esa.int/rtim-federated

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## I.108 GIVE maps (Northern Europe)

### Description

Most recent map of GIVE.

### Status

Ready

### Provider

Norwegian Mapping Authority (NMA)

**Portal Entry Point**

https://swe.ssa.esa.int/rtim-federated

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### I.109a ROTI maps (Northern Europe)

**Description**

Most recent map of the ionospheric disturbance index ROTI.

**Status**

Ready

**Provider**

Norwegian Mapping Authority (NMA)

**Portal Entry Point**

https://swe.ssa.esa.int/rtim-federated

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### I.109b ROTI@Ground maps (Fennoscandia)

**Description**

Most recent map of the ionospheric disturbance index ROTI, as received at ground level.

**Status**

Ready

**Provider**

Norwegian Mapping Authority (NMA)

**Portal Entry Point**

https://swe.ssa.esa.int/rtim-federated

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### I.110a S4 maps (Northern Europe)

**Description**

Most recent map of the S4 scintillation index.

**Status**

Ready

### Provider

Norwegian Mapping Authority (NMA)

### Portal Entry Point

https://swe.ssa.esa.int/rtim-federated

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## I.110b σφ maps (Northern Europe)

### Description

Most recent map of the σφ scintillation index.

### Status

Ready

### Provider

Norwegian Mapping Authority (NMA)

### Portal Entry Point

https://swe.ssa.esa.int/rtim-federated

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## I.110c S4 maps

### Description

Archive of expanded scintillation (S4) maps. The maps contain additional scintillation data that was not available in real-time. Archived scintillation data is available from 14th August 2016 until the 10th October 2024.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Norwegian Mapping Authority (NMA)

### Portal Entry Point

https://swe.ssa.esa.int/rtim-federated

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### I.110d σφ maps

#### Description

Archive of expanded scintillation (σφ) maps. The maps contain additional scintillation data that was not available in real-time. Archived scintillation data is available from the 14th August 2016 until the 10th October 2024.

#### Status

Product provided for demonstration, not assigned to service.

#### Provider

Norwegian Mapping Authority (NMA)

#### Portal Entry Point

https://swe.ssa.esa.int/rtim-federated

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### I.114 Long term prediction (up to 3 month ahead) of foF2, European maps based on the upgraded SIRM model

#### Description

The long term prediction map of foF2 for the whole European region for the current and the following 2 months, developed with data from 10 ionospheric stations, based on the SIRM/CCIR mapping routine.

#### Status

Ready

#### Provider

Ionospheric Group of the National Observatory of Athens (NOA)

#### Portal Entry Point

https://swe.ssa.esa.int/dias-i114-federated

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### I.115 Nowcast European maps of foF2 (based on the upgraded SIRMUP model )

#### Description

The real-time map of foF2 for the whole European region, developed with data from 10 ionospheric stations, based on the SIRMUP mapping routine. The map is made available with a latency of 20 min every hour in both ASCII and PNG formats.

### Status

Ready

### Provider

Ionospheric Group of the National Observatory of Athens (NOA)

### Portal Entry Point

https://swe.ssa.esa.int/dias-i115-federated

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## I.116 Maps of forecasted foF2 over Europe for the next 24 hours, (based on SWIF and GCAM models)

### Description

The maps over Europe (latitude from 34 to 80 deg) of the foF2 parameter, for the next 24 hours, calculated with the SWIF forecast model and mapped using the real-time updated SIRMUP method with background models the SIRM (for mid latitudes) and the CCIR (for the high latitudes). The maps are made available with a latency of 20 min every hour in both ASCII and PNG formats.

### Status

Ready

### Provider

Ionospheric Group of the National Observatory of Athens (NOA)

### Portal Entry Point

https://swe.ssa.esa.int/dias-i116-federated

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## I.117 Near-real-time TEC maps for the European region (based on the TaD model)

### Description

Four different maps are produced for the European region each 15 min of the hour: the map of the integrated electron density from 90km to hmF2 (bottomside TEC), the map of the integrated electron density from hmF2 to the transition height (topside TEC), the map of the integrated electron density from the transition height to 20,000km (Plasmaspheric TEC) and the map of the integrated electron density from 90km to 20,000 km (TEC). The mapped area extends from -10°W to 40°E in longitude and from 34°N to 60°N in latitude, and the spatial resolution of the maps is 1°x1°. The product is based on the 3D electron density grids that are calculated using TaD model (Belehaki et al., 2012; Kutiev et al., 2012) in DIAS system. The maps are made available with a latency of 30 min in both ASCII and PNG formats.

### Status

Ready

### Provider

Ionospheric Group of the National Observatory of Athens (NOA)

### Portal Entry Point

https://swe.ssa.esa.int/dias-i117-federated

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## I.118 Alerts for ionospheric disturbances in the European sector (based on the Alert Algorithm of the SWIF model)

### Description

The EIS Ionospheric Alerts are calculated in the DIAS backend, and are based on the implementation of the Solar Wind driven autoregression model for Ionospheric short-term Forecast (SWIF).

### Status

Ready

### Provider

Ionospheric Group of the National Observatory of Athens (NOA)

### Portal Entry Point

https://swe.ssa.esa.int/dias-i118-federated

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## I.119 Maps, updated in real-time showing the current ionospheric conditions at each station location.

### Description

A map of Europe that presents the current level of ionospheric activity, expressed as the deviation of the observed foF2 parameter in respect to the running 30 days median. The color code (green-orange-red) corresponds to the ionospheric disturbance level (quiet - disturbed - extremely disturbed). The maps are made available with a latency of 15 min in both ASCII and PNG formats.

### Status

Ready

### Provider

Ionospheric Group of the National Observatory of Athens (NOA)

### Portal Entry Point

https://swe.ssa.esa.int/dias-i119-federated

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## I.120 Forecast foF2 values for the next 24 hours over each DIAS ionosonde station, based on the SWIF and on the GCAM models

### Description

Time plot of the foF2 for the next 24 hours at each station location. The forecasted foF2 is calculated with the SWIF model. The 30-daysrunning median foF2 values are overplotted to provide the expected reference level and give to the user an estimation of the expected disturbance. The plots are made available with a latency of 20 min every hour in both ASCII and PNG formats.

### Status

Ready

### Provider

Ionospheric Group of the National Observatory of Athens (NOA)

### Portal Entry Point

https://swe.ssa.esa.int/dias-i120-federated

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## I.121 IONMON TEC maps

### Description

The ESA/ESOC Navigation Support Office delivers animations of Total Electron Content (TEC) and TEC Root Mean Square errors (RMS) global maps. The maps are computed with a single layer approach, taking slant range TEC observables derived from dual-frequency Galileo, GPS, GLONASS and BeiDou data, whereby ionospheric TEC is modelled by spherical harmonics in combination with a daily Differential Code Biases (DCBs) fitting. In this single layer approach, the ionospheric TEC is assumed to be condensed on a hollow sphere enveloping the Earth at an altitude of 450 km. On that sphere, the global TEC distribution is then described by a degree and order 15 spherical harmonics function. The function coefficients are determined from GNSS dual-frequency data recorded at maximum 300 globally distributed (typically 220 - 240) ground sites. Model-internal, all computations are conducted in a solar-geomagnetic reference system.

### Status

Ready

### Supporting facility

SWE Data Centre (SWE Portal)

### Portal Entry Point

https://swe.ssa.esa.int/ionmon/

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## I.122c S4 nowcast modelled maps

### Description

Near-real-time (nowcast) worldwide and continental map and error map of amplitude scintillation index, based on GISM model and assimilated data from geodetic GNSS receivers.

### Status

Ready

### Supporting facility

SWE Data Centre (SWE Portal)

### Portal Entry Point

https://swe.ssa.esa.int/ism

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## I.122d SigmaPhi nowcast modelled maps

### Description

Near-real-time (nowcast) worldwide and continental map and error map of phase scintillation index, based on GISM model and assimilated data from geodetic GNSS receivers.

### Status

Ready

### Supporting facility

SWE Data Centre (SWE Portal)

### Portal Entry Point

https://swe.ssa.esa.int/ism

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## I.122e TEC nowcast modelled maps

### Description

Near-real-time (nowcast) worldwide and continental map and error map of Total Electron Content, based on GISM model and assimilated data from geodetic GNSS receivers.

### Status

Ready

### Supporting facility

SWE Data Centre (SWE Portal)

### Portal Entry Point

https://swe.ssa.esa.int/ism

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## I.122f S4 6-hour forecast modelled maps

### Description

6 hour forecast worldwide and continental maps and error maps of amplitude scintillation index, based on GISM model and assimilated data from geodetic GNSS receivers.

### Status

Ready

### Supporting facility

SWE Data Centre (SWE Portal)

### Portal Entry Point

https://swe.ssa.esa.int/ism

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## I.122g SigmaPhi 6-hour forecast modelled maps

### Description

6 hour forecast worldwide and continental maps and error maps of phase scintillation index, based on GISM model and assimilated data from geodetic GNSS receivers.

### Status

Ready

### Supporting facility

SWE Data Centre (SWE Portal)

### Portal Entry Point

https://swe.ssa.esa.int/ism

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### I.122i S4 nowcast modelled values at a given location

#### Description

Near-real-time (nowcast) values of amplitude scintillation index at a given location, and its associated error, based on GISM model and assimilated data from geodetic GNSS receivers.

#### Status

Ready

#### Supporting facility

SWE Data Centre (SWE Portal)

#### Portal Entry Point

https://swe.ssa.esa.int/ism

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### I.122j SigmaPhi nowcast modelled values at a given location

#### Description

Near-real-time (nowcast) values of phase scintillation index at a given location, and its associated error, based on GISM model and assimilated data from geodetic GNSS receivers.

#### Status

Ready

#### Supporting facility

SWE Data Centre (SWE Portal)

#### Portal Entry Point

https://swe.ssa.esa.int/ism

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### I.122k TEC nowcast modelled values at a given location

#### Description

Near-real-time (nowcast) values of Total Electron Content at a given location, and its associated error, based on GISM model and assimilated data from geodetic GNSS receivers.

#### Status

Ready

#### Supporting facility

SWE Data Centre (SWE Portal)

### Portal Entry Point

https://swe.ssa.esa.int/ism

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## I.122l S4 6h forecast modelled values at a given location

### Description

6 hours graph of amplitude scintillation index at a given location, and its associated error, based on GISM model and assimilated data from geodetic GNSS receivers.

### Status

Ready

### Supporting facility

SWE Data Centre (SWE Portal)

### Portal Entry Point

https://swe.ssa.esa.int/ism

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## I.122m SigmaPhi 6h forecast modelled values at a given location

### Description

6 hours graph of phase scintillation index at a given location, and its associated error, based on GISM model and assimilated data from geodetic GNSS receivers.

### Status

Ready

### Supporting facility

SWE Data Centre (SWE Portal)

### Portal Entry Point

https://swe.ssa.esa.int/ism

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## I.123a SISTED (Sunlit Ionosphere Sudden TEC Enhancement)

### Description

SISTED is monitoring simultaneous sudden enhancements in the ionospheric Total Electron Content (TEC) using the drift rate (second time derivative) of the ionospheric carrier phase product (LI) which can be derived from the GNSS signals. LI is linearly related to the Slant TEC (STEC) along the satellite-receiver ray path under consideration. The drift rate is used to

generate a set of three Impact Parameters (IP). An IP tells (in %) how many satellite-receiver pairs are affected by an abrupt over ionization. The service extracts Near-Real-Time (NRT) data from multiple NTRIP broadcasters, including the ones from the International GNSS Service (IGS, http://igs-ip.net) and from the European Reference Frame (EUREF, http://euref-ip.net).

### Status

Ready

### Provider

UPC-IonSAT (IonSAT)

### Portal Entry Point

https://swe.ssa.esa.int/upc-i123a-federated

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## I.123b SOLERA-drift

### Description

SOLERA (formerly GSFLAI) is based on the impact of ionospheric electron content as response to solar flare activity. The ionospheric response appears as a change in Vertical TEC whose time derivative has a linear dependency on the cosine of Solar Zenith Angle. This relationship can be used to create a proxy for the time derivative of Solar EUV flux (in the spectral band of 21-34 nm). Validation studies with direct Solar EUV measurements by the SOHO SEM instrument (X-class flares during the years 2001-2011) have shown that the GSLAI proxy for EUV flux rate is accurate particularly during moderate and strong activity. In particular, SOLERA drift rate is tailored to detect solar flares occurrence and includes error bars. The service extracts Near-Real-Time (NRT) data from multiple NTRIP broadcasters, including the ones from the International GNSS Service (IGS, http://igs-ip.net) and from the European Reference Frame (EUREF, http://euref-ip.net).

### Status

Ready

### Provider

UPC-IonSAT (IonSAT)

### Portal Entry Point

https://swe.ssa.esa.int/upc-i123b-federated

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## I.123c SOLERA (SOLar Euv flux RAte GNSS proxy)

### Description

SOLERA (formerly GSFLAI) is based on the impact of ionospheric electron content as response to solar flare activity. The ionospheric response appears as a change in Vertical TEC whose time derivative has a linear dependency on the cosine of Solar Zenith Angle. This relationship can be used to create a proxy for the time derivative of Solar EUV flux (in the spectral band of 21-34 nm). Validation studies with direct Solar EUV measurements by the SOHO SEM instrument (X-class flares during the years 2001-2011) have shown that the GSLAI proxy for EUV flux rate is accurate particularly during moderate and strong activity. The service extracts Near-Real-Time (NRT) data from multiple NTRIP broadcasters, including the ones from the International GNSS Service (IGS, http://igs-ip.net) and from the European Reference Frame (EUREF, http://euref-ip.net).

### Status

Ready

### Provider

UPC-IonSAT (IonSAT)

### Portal Entry Point

https://swe.ssa.esa.int/upc-i123c-federated

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## I.123d SISTED warning

### Description

SISTED warning is associated to the detection of mid and strong geoffective solar flares affecting the sunlit ionosphere. SISTED warning is triggered in case the sunlit SISTED Impact Parameter (IP) is above a certain threshold and a minimum number of 50 Ionospheric Pierce Points (IPPs) are processed in the sunlit region.

### Status

Ready

### Provider

UPC-IonSAT (IonSAT)

### Portal Entry Point

https://swe.ssa.esa.int/upc-i123d-federated

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## I.123e SOLERA-drift warning

### Description

SOLERA-drift warning is associated to the detection of mid and strong geoeffective solar flares. SOLERA-drift warning is triggered in case different conditions are fulfilled: (i) minimum slope of 0.002625, (ii) estimated error at least 3 times lower than the absolute GSFLAI value, (iii) minimum number of 140 IPPs in the dayside, and (iv) the range between the maximum and minimum SZA cosine in the dayside should be one or greater.

### Status

Ready

### Provider

UPC-IonSAT (IonSAT)

### Portal Entry Point

https://swe.ssa.esa.int/upc-i123e-federated

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## I.124 The Rate of change of TEC index (ROTI) maps for Europe

### Description

The Rate of change of TEC index (ROTI) can be used as a measure to detect disturbances in the ionosphere. We calculate the ROTI from real-time data streams and associate the calculated values to the ionospheric pierce points. The world map is overlaid with a grid and the averaged ROTI values falling in a certain tile are shown.

### Status

Ready

### Provider

German Aerospace Center (DLR)

### Portal Entry Point

https://swe.ssa.esa.int/impc-i124-federated

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## I.125 Past values of solar activity indices used in atmosphere models

### Description

R (sunspot number), F10.7 (10.7-cm radio flux proxy for solar EUV in solar flux units), S10.7 (10.7-cm radio flux proxy for solar EUV in solar flux units), M10.7, Y10.7 F30 (30-cm solar radio flux).

### Status

Ready

### Provider

Heliogeophysical Prediction Service Laboratory (SRC PAS)

### Portal Entry Point

https://swe.ssa.esa.int/src-federated

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## I.126 Past values of geomagnetic activity indices used in atmosphere models

### Description

Ap (planetary daily magnetic index), Kp (planetary three-hour magnetic index), Dst (Disturbance Storm Time Index), IG12 (12-month-running mean of the ionospheric IG index), IMF (Interplanetary Magnetic field), Aa (K-derived index measured at two antipodal observatories).

### Status

Ready

### Provider

Heliogeophysical Prediction Service Laboratory (SRC PAS)

### Portal Entry Point

https://swe.ssa.esa.int/src-federated

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## I.128 Swarm Rate Of change of TEC (ROT)

### Description

The Rate Of change of TEC (ROT) is used to monitor small-scale variability. It is known that large fluctuations in electron content through which the GPS ray is passing can seriously affect GNSS and create radio wave scintillations that degrade significantly solutions for positioning and navigation. With the demand of enhanced accuracy of GNSS alerts on its reliability increase more and more in importance. Swarm ROT is derived from Swarm Total Electron Content (TEC) data and are continuously provided with a 1 Hz cadence.

### Status

Ready

### Provider

GFZ Helmholtz Centre for Geosciences (GFZ)

### Portal Entry Point

https://swe.ssa.esa.int/gfz-sua-i128-federated

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## I.129 Swarm Total Electron Content (TEC)

### Description

Swarm Total Electron Content (TEC) provides integrated electron density along the line of sight of a GPS ray received at the Swarm satellites (A, B, and C). Each of the Swarm satellite receives up to 8 GPS satellite signals simultaneously; therefore, multiple TEC observations at the same coordinated universal time (UTC) are possible. TEC data are continuously provided for each received GPS satellite with a 1 Hz cadence.

### Status

Ready

### Provider

GFZ Helmholtz Centre for Geosciences (GFZ)

### Portal Entry Point

https://swe.ssa.esa.int/gfz-sua-i129-federated

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## I.130 Swarm electron density (Ne)

### Description

Swarm electron density (Ne) is the in situ measured parameter derived from the Langmuir Probe on-board of the Swarm satellites (A, B, and C). Ne data are continuously provided with a 2 Hz cadence.

### Status

Ready

### Provider

GFZ Helmholtz Centre for Geosciences (GFZ)

### Portal Entry Point

https://swe.ssa.esa.int/gfz-sua-i130-federated

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## I.131 Swarm Ionospheric Bubble Index (IBI)

### Description

Swarm Ionospheric Bubble Index (IBI) provides information on bubble climatology itself as well as on disturbance level of magnetic field data by combining electron density and magnetic field observations. Bubbles (low-latitude post-sunset plasma irregularities) are an intrinsic regular phenomenon in the F-region ionosphere that leaves severe plasma density gradients, magnetic field variations and causes GPS signal scintillations. IBI data are continuously provided with a 1 Hz cadence.

### Status

Ready

### Provider

GFZ Helmholtz Centre for Geosciences (GFZ)

### Portal Entry Point

https://swe.ssa.esa.int/gfz-sua-i131-federated

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## I.132 Atmospheric Density Estimates of Forecast and Prior Total Density for Atmopsheric Drag Calculation

### Description

The ATMDEN service provides estimates of total atmospheric neutral density in the altitude range 120 – 1500 km based on the DTM2013 model.

### Status

Ready

### Provider

UK Met Office (UKMO)

### Portal Entry Point

https://swe.ssa.esa.int/atmden-federated

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## I.133 Nowcasts and Forecasts of Geomagnetic and Solar Indices Needed for Atmospheric Modelling in Support of Atmospheric Drag Calculation.

### Description

The tool provides nowcasts and forecasts of solar and geomagnetic indices needed for atmospheric modelling in support of atmospheric drag calculation. These indices are stored on a

dedicated FORIND database and can be retrieved, in a custom tailored and homogenous form, via a web page or a REST interface in CSV and JSON formats or visualized in PNG format. The FORIND webpage is classed as a tool in the SWE Portal terminology as it provides an interface to numerous indices provided from other sources.

**Status**

Ready

**Provider**

Institute of Space Science Romania (ISS Romania)

**Portal Entry Point**

https://swe.ssa.esa.int/forind-federated

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### I.134a Borowiec Riometer raw [V] and relative [dB]

**Description**

Measurement of 30 MHz by passive riometer antenna in Borowiec (near Poznan, Poland).

**Status**

Ready

**Provider**

Heliogeophysical Prediction Service Laboratory (SRC PAS)

**Portal Entry Point**

https://swe.ssa.esa.int/SRC_RIO-federated

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### I.134b Hornsund riometer measurements

**Description**

Measurement of 30 Mhz by passive riometer antenna in Hornsund (Svalbard).

**Status**

Product provided for demonstration, not assigned to service.

**Provider**

Heliogeophysical Prediction Service Laboratory (SRC PAS)

**Portal Entry Point**

https://swe.ssa.esa.int/SRC_RIO-federated

## I.134c Pallas riometer measurements

### Description

Measurement of 30 and 38 Mhz by passive riometer antenna in Finland near Pallasjarvi lake.

### Status

Ready

### Provider

Heliogeophysical Prediction Service Laboratory (SRC PAS)

### Portal Entry Point

https://swe.ssa.esa.int/SRC_RIO-federated

## I.135a TomoScand3D

### Description

Volumetric reconstructions of ionospheric electron density above Fennoscandia.

### Status

Ready

### Provider

Space and Earth Observation Centre (FMI)

### Portal Entry Point

https://swe.ssa.esa.int/fmi-tomoscand-i135a-federated

## I.135b TomoScand2D

### Description

The TomoScand products present an approach to use Near-Real-Time data from GNSS in regional volumetric reconstructions of ionospheric electron density. The analysis area covers Northern Europe and Fennoscandia. The reconstructions are based on Bayesian statistical inversion, which uses a priori -information from 1-2 ionosondes. The animation shows time evolution of electron density in an altitude-latitude slice along geogr. longitude 25°E from the last three hours by the TomoScand inversion.

### Status

Ready

### Provider

Space and Earth Observation Centre (FMI)

### Portal Entry Point

https://swe.ssa.esa.int/fmi-tomoscand-i135b-federated

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## I.138 GNSS Performance Indicator

### Description

The GNSS Performance Indicator application utilises products available within the SWE Service Network, further processes these products and provides the end user with an indication of positioning uncertainty caused by the ionosphere at their location. These results are retrievable via a web interface and through an API.

### Status

Ready

### Provider

German Aerospace Center (DLR)

### Portal Entry Point

https://swe.ssa.esa.int/GPI-federated

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## I.139 Maximum Usable Frequency for skip-distances of 750 km (MUF750)

### Description

This product provides the regional Maximum Usable Frequency (MUF) for a skip distance of 750 km covering a horizontal area with a radius of 400-500 km from the transmitting station. An information message (including statistical values and a 1-3 hour forecast) follows the MUF data plot. This is completed by a TEC gradient plot for the European sector for assessing the validity and gradients of the products. Further specific MUF data products and time delay of data delivery is added to the above information.

### Status

Ready

### Provider

German Aerospace Center (DLR)

### Portal Entry Point

https://swe.ssa.esa.int/impc-i139-federated

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## I.140 Near real-time maps of hmF2 for the European region

### Description

The near real time maps of hmF2 for the European region, developed with data from 8 ionospheric stations. The maps are produced through the implementation of Polyweight interpolation procedure, a modification of the “inverse distance to a power” gridding method that calculates parameter values at the 2D grid nodes. The map is made available with a latency of 30 min every 15 min in both ASCII and PNG formats. The mapped area extends from -10 W to 40 E in longitude and from 30 N to 72 N in latitude. The spatial resolution of the maps is 1x1.

### Status

Ready

### Provider

Ionospheric Group of the National Observatory of Athens (NOA)

### Portal Entry Point

https://swe.ssa.esa.int/dias-i140-federated

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## I.141 Swarm Rate Of change of TEC Index (ROTI)

### Description

The Rate Of TEC (Total Electron Content) Index (ROTI) is defined as the standard deviation of the Rate Of change of TEC (ROT) over a defined time interval. ROTI is one of the most widely used indies to monitor and provide information about temporal ionospheric irregularities. The topside Swarm ROTI is calculated over a one-minute interval and provided as a data product with a 1Hz (1s) cadence in units of TECU/s along all three Swarm satellite orbits.

### Status

Ready

### Provider

GFZ Helmholtz Centre for Geosciences (GFZ)

### Portal Entry Point

https://swe.ssa.esa.int/gfz-sua-i141-federated

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### I.142 TechTIDE ionospheric electron density perturbation maps

#### Description

European maps of the electron density perturbation in respect to monthly median conditions of the Ne perturbation at fixed heights (200km, 300km, 400km, and 500km). They are updated every 15 min, and they are provided in both ASCII and image (png) formats.

#### Status

Ready

#### Provider

Ionospheric Group of the National Observatory of Athens (NOA)

#### Portal Entry Point

https://swe.ssa.esa.int/techtide-i142-federated

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### I.143 TechTIDE GNSS TEC gradient

#### Description

Maps of horizontal gradient of Total Electron Content (TEC), derived from Ionosphere Monitoring and Prediction Center (IMPC) near real-time TEC maps. They are updated every 5 min, and they are provided in both ASCII and image (png) formats.

#### Status

Ready

#### Provider

Ionospheric Group of the National Observatory of Athens (NOA)

#### Portal Entry Point

https://swe.ssa.esa.int/techtide-i143-federated

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### I.144 TechTIDE LSTID detector maps

#### Description

Maps with velocity, azimuth of Large Scale Travelling Ionospheric Disturbances (LSTID) and associated ionospheric variability over Digisonde sensors of Europe. They are updated every 5 min, and they are provided in both ASCII and image (png) formats.

#### Status

Ready

### Provider

Ionospheric Group of the National Observatory of Athens (NOA)

### Portal Entry Point

https://swe.ssa.esa.int/techtide-i144-federated

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## I.145 TechTIDE LSTID parameters over station

### Description

Time plot of the Large Scale Travelling Ionospheric Disturbances (LSTID) parameters over Digisonde stations, velocity, azimuth, period, Spectral Energy Contribution (SEC) and TID associated variability. It is updated every 5 min, and it is provided in both ASCII and image (png) formats.

### Status

Ready

### Provider

Ionospheric Group of the National Observatory of Athens (NOA)

### Portal Entry Point

https://swe.ssa.esa.int/techtide-i145-federated

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## I.146 TechTIDE LSTID activity index

### Description

Time plot of the Large Scale Travelling Ionospheric Disturbances activity index (LSTIDx) over Digisonde stations, providing the relative standard deviation of the critical frequency of the F2 layer of the ionosphere (foF2) within an hour. It is updated every 15 min, and it is provided in both ASCII and image (png) formats.

### Status

Ready

### Provider

Ionospheric Group of the National Observatory of Athens (NOA)

### Portal Entry Point

https://swe.ssa.esa.int/techtide-i146-federated

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### I.147 TechTIDE AATR indicator maps

#### Description

Global and European maps of Along Arc Total Electron Content (TEC) Rate (AATR) indicator. They are updated every 5 min, and they are provided in both ASCII and image (png) formats.

#### Status

Ready

#### Provider

Ionospheric Group of the National Observatory of Athens (NOA)

#### Portal Entry Point

https://swe.ssa.esa.int/techtide-i147-federated

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### I.148 TechTIDE AATR indicator daily plots

#### Description

Time plots of Along Arc Total Electron Content (TEC) Rate (AATR) for selected stations (located at significant different latitudes) at daily intervals. They are updated every 5 min, and they are provided in both ASCII and image (png) format.

#### Status

Ready

#### Provider

Ionospheric Group of the National Observatory of Athens (NOA)

#### Portal Entry Point

https://swe.ssa.esa.int/techtide-i148-federated

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### I.149 TechTIDE Medium Scale Travelling Ionospheric Disturbances (MSTID) detection for Czech Republic, Doppler system based

#### Description

Continuous Doppler Sounding System (CDSS) data, updated every 15 min, are provided in both ASCII and image format. Raw data, spectrograms and main observed wave parameters – results from the CDSS in Czech Republic, in 45 min window, refreshed every 15 min, are provided.

#### Status

Ready

### Provider

Ionospheric Group of the National Observatory of Athens (NOA)

### Portal Entry Point

https://swe.ssa.esa.int/techtide-i149-federated

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## I.150 TechTIDE MSTID index maps

### Description

Global maps of Medium Scale Travelling Ionospheric Disturbances index (MSTIDx). They are updated every 5 min, and they are provided in both ASCII and image (png) format.

### Status

Ready

### Provider

Ionospheric Group of the National Observatory of Athens (NOA)

### Portal Entry Point

https://swe.ssa.esa.int/techtide-i150-federated

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## I.151 TechTIDE MSTID index daily plots

### Description

Time plots of Medium Scale Travelling Ionospheric Disturbances index (MSTIDx) for selected stations (located at significant different latitudes) at daily intervals. They are updated every 5 min, and they are provided in both ASCII and image (png) format.

### Status

Ready

### Provider

Ionospheric Group of the National Observatory of Athens (NOA)

### Portal Entry Point

https://swe.ssa.esa.int/techtide-i151-federated

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### I.152 TechTIDE TID Activity Report

#### Description

List of all methods' critical characteristics with the indicator of the Travelling Ionospheric Disturbances (TID) activity level, updated every 5 min.

#### Status

Ready

#### Provider

Ionospheric Group of the National Observatory of Athens (NOA)

#### Portal Entry Point

https://swe.ssa.esa.int/techtide-i152-federated

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### I.153 Nowcasting of MUF(3000)F2 over Europe

#### Description

The near real-time maps of Maximum Usable Frequency (MUF) at a distance of 3000 km are estimated every 15 minutes from real-time ionosonde data recorded at several stations across Europe. These measurements are integrated into the International Reference Ionosphere (IRI) background model, which is upgraded according to the relative deviations at the stations. Kriging techniques are then applied for spatial interpolation.

#### Status

Ready

#### Provider

Istituto Nazionale di Geofisica e Vulcanologia (INGV)

#### Portal Entry Point

https://swe.ssa.esa.int/ingv-i153-federated

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### I.154 Nowcasting of MUF(3000)F2 ratio over Europe

#### Description

This product is the ratio between the nowcast for Maximum Usable Frequency (MUF) at a distance of 3000 km across Europe, derived from realtime ionosonde data and the background, the latter being the MUF monthly median based on the International Reference Ionosphere Model (IRI).

### Status

Ready

### Provider

Istituto Nazionale di Geofisica e Vulcanologia (INGV)

### Portal Entry Point

https://swe.ssa.esa.int/ingv-i154-federated

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## I.155 Short Term Forecasting of MUF(3000)F2 over Europe

### Description

Results from EUROMAP, a model developed for the Eurasian sector, for forecasting 24 hours in advance the Maximum Usable Frequency (MUF) at a distance of 3000 km.

### Status

Ready

### Provider

Istituto Nazionale di Geofisica e Vulcanologia (INGV)

### Portal Entry Point

https://swe.ssa.esa.int/ingv-i155-federated

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## I.156 Short Term Forecasting of MUF(3000)F2 ratio over Europe

### Description

This product is the ratio between the 24-hour advance forecast for Maximum Usable Frequency (MUF) at a distance of 3000 km across Europe, derived from the EUROMAP model and the background, the latter being the MUF monthly median based on the International Reference Ionosphere Model (IRI).

### Status

Ready

### Provider

Istituto Nazionale di Geofisica e Vulcanologia (INGV)

### Portal Entry Point

https://swe.ssa.esa.int/ingv-i156-federated

## I.157 Nowcasting of TEC over Italy

### Description

Based on real-time GNSS data from the RING network broadcast via NTRIP, ionospheric vTEC maps are estimated every 10 minutes on a 0.1 deg x 0.1 deg grid. The vTEC values estimated at the ionospheric piercing points are interpolated using local (weighted) regression scatter plot smoothing (LOWESS). No ionospheric input model is ingested in order to better highlight ionospheric irregularities.

### Status

Ready

### Provider

Istituto Nazionale di Geofisica e Vulcanologia (INGV)

### Portal Entry Point

https://swe.ssa.esa.int/ingv-i157-federated

## I.158 Short Term Forecasting of TEC over Italy

### Description

Based on nowcasting TEC maps over the Mediterranean area provided by the INGV, vTEC forecast maps over the Mediterranean area are estimated 30 minutes in advance every 10 minutes on a 0.1 deg x 0.1 deg grid. Forecasting is based on linear trends for each grid point calculated considering the hourly vTEC values.

### Status

Ready

### Provider

Istituto Nazionale di Geofisica e Vulcanologia (INGV)

### Portal Entry Point

https://swe.ssa.esa.int/ingv-i158-federated

## I.159 Polar Radio Link

### Description

Polar Radio Link - Estimated Signal to Noise Ratio for Polar Radio Link over 1.8 MHz.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Heliogeophysical Prediction Service Laboratory (SRC PAS)

### Portal Entry Point

https://swe.ssa.esa.int/SRC_RIO-federated

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## I.160 Absorption alerts at 30 MHz and 38 MHz

### Description

Absorption alerts based on the riometer measurements.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Heliogeophysical Prediction Service Laboratory (SRC PAS)

### Portal Entry Point

https://swe.ssa.esa.int/SRC_RIO-federated

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## I.161 Satellite Orbit DecAy (SODA) Neutral density forecast

### Description

SODA (Satellite Orbit DecAy) provides a 15-hour forecast for satellite orbit decays induced mostly by interplanetary coronal mass ejections (ICMEs), having strong negative Bz. The calculated orbit drop (OD) results are normalized for satellites at orbit heights of about 490 km. The forecasting model has been trained with accelerometer data from GRACE mission satellites, therefore the actual drop value is applicable for satellites that have similar drag coefficient and that orbit at similar altitude.

### Status

Ready

### Provider

Institute of Physics (IGAM)

### Portal Entry Point

https://swe.ssa.esa.int/soda-federated

## I.162 UQRG-GIM - rapid 15-minute resolution global VTEC maps

### Description

Rapid 15-minute resolution VTEC Global Ionospheric Maps computed by UPC's TOMION-v2 software and based on multi-GNSS measurements in RINEX format from a world-wide network of permanent GNSS receivers.

### Status

Ready

### Provider

UPC-IonSAT (IonSAT)

### Portal Entry Point

https://swe.ssa.esa.int/upc-i162-federated

## I.163 ROTI nowcast for the Arctic region

### Description

The map displays the current Rate Of change of Total Electron Content Index (ROTI) modeled over the Arctic region. A new map is issued every 15 minutes, ROTI is expressed as TECU/min.

### Status

Ready

### Provider

University of Oslo (UiO)

### Portal Entry Point

https://swe.ssa.esa.int/ispa-rotinow-federated

## I.164 ROTI forecast for the Arctic region

### Description

The maps display the predicted Rate Of change of Total Electron Content Index (ROTI) forecasted over the Arctic region at several lead times: 15, 30 45, 60 and 180 minutes. New forecast maps are issued every 15 minutes, ROTI is expressed as TECU/min.

### Status

Ready

### Provider

University of Oslo (UiO)

### Portal Entry Point

https://swe.ssa.esa.int/ispa-rotifor-federated

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## I.165 Ionospheric scintillation activity nowcast for the Arctic region

### Description

The map displays the current scintillation activity modelled over the Arctic region. A new map is issued every 15 minutes, scintillation is displayed at three level of activity: low, medium and high.

### Status

Ready

### Provider

University of Oslo (UiO)

### Portal Entry Point

https://swe.ssa.esa.int/ispa-scintnow-federated

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## I.166 Ionospheric scintillation activity forecast for the Arctic region

### Description

The map displays the predicted scintillation activity forecasted over the Arctic region at several lead times: 15, 30 45, 60 and 180 minutes. New forecast maps are issued every 15 minutes, scintillation is displayed at three level of activity: low, medium and high.

### Status

Ready

### Provider

University of Oslo (UiO)

### Portal Entry Point

https://swe.ssa.esa.int/ispa-scintfor-federated

## I.169 AIDA Global Map Nowcasts of vertical Total Electron Content (vTEC)

### Description

The map displays the vertical Total Electron Content (vTEC) over the globe as produced by the 3D data assimilation model AIDA. Two new maps are issued every 5 minutes, an Ultra-Rapid product with 5 minute latency and a Rapid product with 90 minute latency. vTEC is expressed in TECu (10^{16} electrons per square meter).

### Status

Ready

### Provider

Space Environment and Radio Engineering Group (SERENE)

### Portal Entry Point

https://swe.ssa.esa.int/AIDA-TEC-N-federated

## I.170 AIDA Global Map Forecasts of vertical Total Electron Content (vTEC)

### Description

The map displays the forecasted vertical Total Electron Content (vTEC) over the globe as produced by the 3D data assimilation model AIDA. Every 5 minutes a 0.5, 1.5, 3 and 6 hour forecast are produced from both the Ultra-Rapid and Rapid AIDA models. vTEC is expressed in TECu (10^{16} electrons per square meter).

### Status

Ready

### Provider

Space Environment and Radio Engineering Group (SERENE)

### Portal Entry Point

https://swe.ssa.esa.int/AIDA-TEC-F-federated

## I.171 AIDA Global 3D Reconstruction Nowcasts of Electron Density (Ne)

### Description

The graphic is an interactive 3D map. This shows a 2D vertical Total Electron Content (vTEC) map on the 'floor' of the image, and then longitudinal and latitudinal slices through the full 3D AIDA model, which can be rotated and zoomed into. Two new graphics are issued every 5

minutes, an Ultra-Rapid product with 5 minute latency and a Rapid product with 90 minute latency. The 2D vTEC map is in TEC Units (10^{16} electrons per square meter) and the slices of the full 3D structure are in electron density per m3 (Ne/m^3).

### Status

Ready

### Provider

Space Environment and Radio Engineering Group (SERENE)

### Portal Entry Point

https://swe.ssa.esa.int/AIDA-Ne-N-federated

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## I.172 AIDA Global 3D Reconstruction Forecasts of Electron Density (Ne)

### Description

The graphic is an interactive 3D map. This shows the forecasted 2D vertical Total Electron Content (vTEC) map on the 'floor' of the image, and then the forecasted longitudinal and latitudinal slices through the full 3D AIDA model, which can be rotated and zoomed into. Every 5 minutes graphics are issued for the 0.5, 1.5, 3 and 6 hour forecats from the Ultra-Rapid and Rapid AIDA models with 5 minute latency. The 2D vTEC map is in TEC Units (10^{16} electrons per square meter) and the slices of the full 3D structure are in electron density per m3 (Ne/m^3).

### Status

Ready

### Provider

Space Environment and Radio Engineering Group (SERENE)

### Portal Entry Point

https://swe.ssa.esa.int/AIDA-Ne-F-federated

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## I.173 AIDA Global Nowcasts of Ionospheric Parameters

### Description

These four maps display the vertical Total Electron Content (vTEC), Maximum Useable Frequency at 3000 km (MUF3000), the critical plasma frequency (foF2) and its associated height (hmF2) over the globe as produced by the 3D data assimilation model AIDA. New maps are issued every 5 minutes, an Ultra-Rapid product with 5 minute latency and a Rapid product with 90 minute latency. vTEC is expressed in TECu (10^{16} electrons per square meter), MUF3000 in MHz, foF2 in MHz and hmF2 in km.

### Status

Ready

### Provider

Space Environment and Radio Engineering Group (SERENE)

### Portal Entry Point

https://swe.ssa.esa.int/AIDA-Par-N-federated

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#### I.174 AIDA Global Forecasts of Ionospheric Parameters

### Description

These four maps display the forecasted vertical Total Electron Content (vTEC), Maximum Useable Frequency at 3000 km (MUF3000), the critical plasma frequency (foF2) and its associated height (hmF2) over the globe as produced by the 3D data assimilation model AIDA. Every 5 minutes a 0.5, 1.5, 3 and 6 hour forecast are produced from both the Ultra-Rapid product with 5 minute latency and a Rapid product with 90 minute latency. vTEC is expressed in TECu (10^{16} electrons per square meter), MUF3000 in MHz, foF2 in MHz and hmF2 in km.

### Status

Ready

### Provider

Space Environment and Radio Engineering Group (SERENE)

### Portal Entry Point

https://swe.ssa.esa.int/AIDA-Par-F-federated

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## 1.5. Geomagnetic conditions products

#### G.101 Magnetogrammes from North(West) Europe and Greenland

### Description

This product provides magnetograms from several ground magnetometer stations, sorted by responsible institute. Each station measures the variations in the Earth's magnetic field in three directions orthogonal on each other. The measurements are calibrated to the horizontal intensity of the magnetic field vector, H (see figure), the declination, D, and the vertical component of the magnetic field vector, Z (all three components are available at the product page).

**Status**

Ready

**Provider**

DTU Space (DTU)

**Portal Entry Point**

https://swe.ssa.esa.int/nrt-mag-federated

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### G.102 K-index from magnetometer stations in north Europe

**Description**

K-index is a 3h interval index that reflects the local geomagnetic activity level at ground. The index output is an integer between 0 and 9 determined by the range of the horizontal geomagnetic components within the 3h interval in consideration.

**Status**

Ready

**Provider**

DTU Space (DTU)

**Portal Entry Point**

https://swe.ssa.esa.int/dtu-k-federated

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### G.106 Aurora forecast service

**Description**

Forecasts of expected oval locations and cloudiness information with lead times of 3, 6, 9, and 12 hours are shown for Finland and Norway.

**Status**

Ready

**Provider**

Space and Earth Observation Centre (FMI)

**Portal Entry Point**

https://swe.ssa.esa.int/fmi-g106-federated

## G.107 Nowcast Kp index

### Description

This product shows the 3-hourly nowcast Kp index of global geomagnetic activity during the present UTC day as a bar plot. The height of the bar(s) corresponds to the index value (0 to 9) and the colour represents the geomagnetic activity level (low - green (Kp < 3.3), intermediate - yellow (3 < Kp < 6.3), high - red (Kp > 6)). A smaller version of this plot is given for the preceding 6 days. The nowcast Kp values are calculated at GFZ from near real-time geomagnetic observatory data provided by the contributing observatories. Nowcast values of Kp are typically made available at the end of the measurement interval.

### Status

Ready

### Provider

GFZ Helmholtz Centre for Geosciences (GFZ)

### Portal Entry Point

https://swe.ssa.esa.int/gfz-g107-federated

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## G.108 Most recent definitive Kp index

### Description

This product, the so-called musical diagram, shows a plot of the 3-hourly definitive Kp index of global geomagnetic activity during approximately 5 recent solar rotations. A key at the bottom of the plot provides an explanation on how to read it and solar rotation numbers as well as UTC days are indicated in the plot. The definitive Kp is calculated from K values provided by the contributing observatories. This figure is typically produced with a lag time of one to four weeks, as K values from contributing observatories become available. The contributing observatories report these K values in half-monthly intervals with typical delay times of one or two weeks after each half-monthly interval.

### Status

Ready

### Provider

GFZ Helmholtz Centre for Geosciences (GFZ)

### Portal Entry Point

https://swe.ssa.esa.int/gfz-g108-federated

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## G.109 Kp and Ap index on tabular form

### Description

This product shows a table of the nowcast Kp, ap and Ap index of global geomagnetic activity for the present day and the preceding 14 days. Kp and ap are 3-hourly indices, whereas Ap is a daily index. The index values are given in one line per day. Non-existing values are indicated by 'nan'. Below the table, there are links to two downloadable ASCII-files representing the same information. One file gives Kp (in steps of 0.3 or 0.4 from 0 to 9), ap, and Ap and indicates missing values as 'nan'. The other file gives Kp*10 (in steps of 3 or 4 from 0 to 90), ap and Ap and has 99 and 999 as missing data indicator. ap values are derived from Kp. Ap is the daily average of ap. The nowcast Kp values are calculated at GFZ from near real-time geomagnetic observatory data provided by the contributing observatories. Nowcast values of Kp are typically made available at the end of the measurement interval.

### Status

Ready

### Provider

GFZ Helmholtz Centre for Geosciences (GFZ)

### Portal Entry Point

https://swe.ssa.esa.int/gfz-g109-federated

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## G.110 Kp and Ap index archive

### Description

In this product yearly files of the definitive Kp, ap and Ap index are given back to 1932. The index values are given in one line per day. Non-existing values are indicated by 'nan'. Next to the table, there are links to two downloadable ASCII-files representing the same information. One file gives Kp (in steps of 0.3 or 0.4 from 0 to 9), ap, and Ap and indicates missing values as 'nan'. The other file gives Kp*10 (in steps of 3 or 4 from 0 to 90), ap and Ap and has 99 and 999 as missing data indicator. ap values are derived from Kp. Ap is the daily average of ap. The definitive Kp is calculated from K values provided by the contributing observatories. The files are typically updated with a lag time of one to four weeks, as K values from contributing observatories become available. The contributing observatories report these K values in half-monthly intervals with typical delay times of one or two weeks after each half-monthly interval.

### Status

Ready

### Provider

GFZ Helmholtz Centre for Geosciences (GFZ)

### Portal Entry Point

https://swe.ssa.esa.int/gfz-g110-federated

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## G.111 Maps for power and pipeline operators

### Description

The electric field on the ground and geomagnetically induced currents are modelled using geomagnetic recordings. GIC are shown for the Finnish and Norwegian power grids.

### Status

Ready

### Provider

Space and Earth Observation Centre (FMI)

### Portal Entry Point

https://swe.ssa.esa.int/fmi-g111-federated

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## G.112 Table of modelled GIC

### Description

Text files of the modelled GIC in the Finnish and Norwegian power grids during the latest 24 hours, and similarly for the Finnish natural gas pipeline.

### Status

Ready

### Provider

Space and Earth Observation Centre (FMI)

### Portal Entry Point

https://swe.ssa.esa.int/fmi-g112-federated

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## G.113 Forecasts of dB/dt

### Description

Forecast of the 30-minute maximum of horizontal|dB/dt| with lead times between 20 to 80 minutes depending on solar wind speed.

**Status**

Ready

**Provider**

Swedish Institute of Space Physics (IRF)

**Portal Entry Point**

https://swe.ssa.esa.int/irf-g113-federated

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### G.114 Pipe-to-soil voltage (PSV)

**Description**

Modelled PSV, and modelled GIC in the Finnish natural gas pipeline.

**Status**

Ready

**Provider**

Space and Earth Observation Centre (FMI)

**Portal Entry Point**

https://swe.ssa.esa.int/fmi-g114-federated

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### G.123 Swarm Polar Electrojet (PEJ)

**Description**

The location of the Polar Electrojet (PEJ) is determined from magnetic measurements by the Swarm satellites. PEJs (Polar Electrojets) are believed to be the principal cause of magnetic disturbances giving rise to problems in power systems as a result of geomagnetically induced currents. Swarm PEJ product gives the possibility for studying the evolution of PEJ during geomagnetic quiet times and geomagnetic storms, in particular their migration from high- to mid-latitudes. The location and intensity of the PEJ determine the possibility that power supply failure might occur due to ground-induced currents.

**Status**

Ready

**Provider**

GFZ Helmholtz Centre for Geosciences (GFZ)

### Portal Entry Point

https://swe.ssa.esa.int/gfz-g123-federated

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## G.124 Swarm Field-Aligned Current (FAC)

### Description

Swarm satellites provide the Field-Aligned Currents (FACs), which play an important role in magnetosphere-ionosphere interactions. They are the main mechanism of energy coupling from the solar wind into the high-latitude upper atmosphere. As FAC acts as a connector between the magnetosphere and ionosphere at high latitudes, exact information on FACs can help to give constraints on many physical parameters: e.g., ionospheric conductivity. Swarm FAC data are continuously provided with a 1 Hz cadence.

### Status

Ready

### Provider

GFZ Helmholtz Centre for Geosciences (GFZ)

### Portal Entry Point

https://swe.ssa.esa.int/gfz-g124-federated

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## G.125 Swarm Vector Magnetic Field (MAG)

### Description

Swarm satellites provide vector measurements of the magnetic field and the magnetic field intensity. Swarm MAG is provided as time series of 1 Hz (low resolution) vector measurements of the magnetic field and the magnetic field intensity from the scalar magnetometer (ASM). Swarm MAG data are continuously provided with a 1 Hz cadence.

### Status

Ready

### Provider

GFZ Helmholtz Centre for Geosciences (GFZ)

### Portal Entry Point

https://swe.ssa.esa.int/gfz-g125-federated

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### G.126 Local Disturbance index for Spain

**Description**

Indication of the geomagnetic disturbance field on the ground for Spain.

**Status**

Ready

**Provider**

Universidad de Alcalá (UAH)

**Portal Entry Point**

https://swe.ssa.esa.int/uah-senmes-g126-federated

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### G.127 Local Current index for Spain

**Description**

Indication of the geoelectric field on the ground for Spain.

**Status**

Ready

**Provider**

Universidad de Alcalá (UAH)

**Portal Entry Point**

https://swe.ssa.esa.int/uah-senmes-g127-federated

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### G.128 Geomagnetic Storm Occurrence

**Description**

Geomagnetic storm alert predicting a variation greater than 50 nT.

**Status**

Ready

**Provider**

Universidad de Alcalá (UAH)

### Portal Entry Point

https://swe.ssa.esa.int/uah-senmes-g128-federated

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## G.129 Geomagnetic Storm Recovery Phase

### Description

The plot shows with a green line Dst data. When Dst values go below -100 nT, the recovery phase model is plotted with a blue line, indicating also the UT time of occurrence and the expected time for the magnetosphere to recover. UT time of the last data value used as input is also shown.

### Status

Ready

### Provider

Universidad de Alcalá (UAH)

### Portal Entry Point

https://swe.ssa.esa.int/uah-senmes-g129-federated

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## G.130 Geomagnetic Storm Subscription

### Description

Automatic e-mail warnings from SolarHeed [G.128] and SolarHoldover[G.129].

### Status

Ready

### Provider

Universidad de Alcalá (UAH)

### Portal Entry Point

https://swe.ssa.esa.int/uah-senmes-g130-federated

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## G.131 Geomagnetic Conditions Scale

### Description

Color code scale indicating the level of disturbance according to LDiñ.

**Status**

Ready

**Provider**

Universidad de Alcalá (UAH)

**Portal Entry Point**

https://swe.ssa.esa.int/uah-senmes-g131-federated

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### G.132 GIC Conditions Scale

**Description**

Color code scale indicating the level of disturbance according to LCiñ.

**Status**

Ready

**Provider**

Universidad de Alcalá (UAH)

**Portal Entry Point**

https://swe.ssa.esa.int/uah-senmes-g132-federated

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### G.133 Conditions Reports

**Description**

An automatic report describing the values of Sentinel G [G.131] and Sentinel C [G.132].

**Status**

Ready

**Provider**

Universidad de Alcalá (UAH)

**Portal Entry Point**

https://swe.ssa.esa.int/uah-senmes-g133-federated

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## G.134 Forecast of Kp

### Description

Forecast of Kp index with up to 4 hours lead-time.

### Status

Ready

### Provider

Swedish Institute of Space Physics (IRF)

### Portal Entry Point

https://swe.ssa.esa.int/irf-g134-federated

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## G.135 Forecast of Dst

### Description

Forecast of Dst index with up to 2 hours lead-time.

### Status

Ready

### Provider

Swedish Institute of Space Physics (IRF)

### Portal Entry Point

https://swe.ssa.esa.int/irf-g135-federated

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## G.136 3-hourly K index: Lerwick, Eskdalemuir, Hartland

### Description

Definitive and nowcast K-indices from the three UK observatories. The 3-hourly K-index is a measure of disturbance in the horizontal components of the Earth's magnetic field over a 3-hourly interval.

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g136-federated

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## G.137a Global activity indices nowcasts (aa)

### Description

The 3-hourly aa-index is a simple global geomagnetic activity index. It is derived from the K indices from two approximately antipodal observatories and has units of 1 nT. This index extends further back (to 1868) than any other 3-hourly planetary index time series.

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g137a-federated

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## G.137b Global activity indices nowcasts (Kp)

### Description

The 3-hour Kp-index is a mid-latitude/sub-auroral planetary magnetic activity index. Although classed as a global index, historically the Kp network of observatories was heavily weighted to the northern hemisphere, in particular to Europe and Northern America.

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g137b-federated

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## G.137c Global activity indices nowcasts (ap)

### Description

The 3-hourly ap-index is a planetary magnetic activity index on a linear scale with units of 2nT. Related to the Kp-index, which is the quasi-logarithmic equivalent, ap is a measure of global geomagnetic activity at mid- and sub-auroral latitudes.

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g137c-federated

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## G.137d Global activity indices nowcasts (Aa)

### Description

The daily Aa index is the average of the eight 3-hourly aa values for that day. The 3-hourly aa-index is a simple global geomagnetic activity index. It is derived from the K indices from two approximately antipodal observatories and has units of 1 nT.

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g137d-federated

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## G.137e Global activity indices nowcasts (Ap)

### Description

The daily Ap index is the average of the eight 3-hourly ap values for that day. The 3-hourly ap-index is a planetary magnetic activity index on a linear scale with units of 2nT. Related to the Kp-index, which is the quasi-logarithmic equivalent, ap is a measure of global geomagnetic activity at mid- and sub-auroral latitudes.

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g137e-federated

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## G.138 ap index forecast: 3 hourly values, 3 day forecast window

### Description

The ap-index is a 3-hour planetary magnetic activity index on a linear scale with units of 2nT. It is a measure of global geomagnetic activity levels at mid- and sub-auroral latitudes. The ap forecasts are for the next 72 hours (or 3 days).

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g138-federated

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## G.139 Ap index forecast: daily values, 27 day forecast window

### Description

The Ap-index is a daily planetary magnetic activity index on a linear scale with units of 2nT. It is a measure of global geomagnetic activity levels at mid- and sub-auroral latitudes. The Ap forecasts are for the next 27 days, with today counting as day 1.

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g139-federated

## G.140 Horizontal electric field data (UK)

### Description

Measurements of the surface electric field at the three magnetic observatories in the United Kingdom. The data presented are ten-second values filtered from raw 10hz samples without any quality control.

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g140-federated

## G.141 3-hourly K(GBI) index

### Description

The 3-hourly K(GBI) index is a regional version of the planetary Kp magnetic activity index covering UK and Eire. It is based on a quasi-logarithmic 28 point scale, ranging from 0 to 9, with sub-divisions of one third between each whole value.

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g141-federated

## G.142 K(GBI) forecast: 3 hourly values, 3 day forecast window

### Description

The 3-hourly K(GBI) index is a regional version of the planetary Kp magnetic activity index. It is based on a quasi-logarithmic 28 point scale, ranging from 0 to 9, with sub-divisions of one third between each whole value. The K(GBI) index forecasts are for the next 72 hours (or 3 days).

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g142-federated

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## G.143 Horizontal magnetic rate of change (UK)

### Description

Measurements of the rate of change of the horizontal magnetic field (dH/dt) for the three UK magnetic observatories in the X (North) and Y (East) components.

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g143-federated

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## G.144 PCN index

### Description

The Polar Cap index (PC index) monitors the energy input from the solar wind to the magnetosphere, and is constructed as a linear relationship with the merging Electric Field, Em, at the magnetopause; consequently PC is given in electric field units of mV/m.

### Status

Ready

### Provider

DTU Space (DTU)

### Portal Entry Point

https://swe.ssa.esa.int/dtu-pcn-federated

### G.145 AE, AL and AU forecasts

#### Description

Forecasts of the AE, AL and AU indices with 20 to 110 minutes lead time.

#### Status

Ready

#### Provider

Swedish Institute of Space Physics (IRF)

#### Portal Entry Point

https://swe.ssa.esa.int/irf-g145-federated

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### G.146 Auroral data from Kiruna

#### Description

The product provides access to all-sky images from IRF Kiruna digital all-sky camera (DASC) for both real-time and from archive with 1-minute resolution.

#### Status

Ready

#### Provider

Swedish Institute of Space Physics (IRF)

#### Portal Entry Point

https://swe.ssa.esa.int/irf-aurora-federated

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### G.147 Storm risk next 24h

#### Description

The product provides an estimate of the risk that a geomagnetic storm will occur within the next 24 hours.

#### Status

Ready

#### Provider

DTU Space (DTU)

### Portal Entry Point

https://swe.ssa.esa.int/StormRisk24-federated

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## G.148 Peak Geomagnetically Induced Current (GIC) for Scotland, England, Wales and the UK

### Description

Model output of the peak GIC (in Amps) anywhere. Separate data sets for Scotland, England, Wales and the whole UK.

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g148-federated

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## G.149 Average Geomagnetically Induced Current (GIC) for Scotland, England, Wales and the UK

### Description

Model output of the average GIC anywhere. Separate data sets for Scotland, England, Wales and the whole UK.

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g149-federated

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## G.150 Peak Pipe-to-Soil Potential (PSP) for Scotland, England, Wales and the UK

### Description

Model output of the peak PSP in Volts in the high-pressure gas pipeline transmission system. Separate data sets for Scotland, England, Wales, the whole UK and an individual pipeline that runs N-S along the east coast of Scotland.

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g150-federated

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## G.151 Average Pipe-to-Soil Potential (PSP) for Scotland, England, Wales and the UK

### Description

Model output of the Average PSP in Volts in the high-pressure gas pipeline transmission system. Separate data sets for Scotland, England, Wales, the whole UK and an individual pipeline that runs N-S along the east coast of Scotland.

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g151-federated

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## G.153a Nowcast Hp60 index

### Description

This product shows the 60-minutes nowcast Hp60 index of global geomagnetic activity during the present UTC day as a bar plot. The height of the bar(s) corresponds to the index value (0 to open-end) and the colour represents the geomagnetic activity level: Low - green (Hp60 < 3.3), Intermediate - yellow (3 < Hp60 < 6.3), High - red (Hp60 > 6). A smaller version of this plot is given for the preceding 6 days. The nowcast Hp60 values are calculated at GFZ from near real-time geomagnetic observatory data provided by the contributing observatories. Nowcast values of Hp60 are typically made available shortly before or after the end of the measurement interval.

### Status

Ready

### Provider

GFZ Helmholtz Centre for Geosciences (GFZ)

### Portal Entry Point

https://swe.ssa.esa.int/gfz-g153a-federated

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## G.153b Hp60 and ap60 index in tabular form

### Description

This product shows a table of the nowcast Hp60 and ap60 index of global geomagnetic activity for the present day and the preceding 14 days. Hp60 and ap60 are 60-minute indices. The index values are given in one line per day in the 3-hourly interval as for Kp index but instead of one value, three values are provided for each 3-hour interval, from top to bottom. Non-existing values are indicated by -1.000 for Hp60 and -1 for ap60. Below the table, there is a link to a downloadable ASCII-file (that has 30 header lines, all starting with #) representing the information for the present and the preceding 28 days. ap60 values (a linear scale) are derived from Hp60. The Hp60 values are calculated at GFZ from near real-time geomagnetic observatory data provided by the contributing observatories. Values of Hp60 and ap60 are typically made available at the end of the measurement interval.

### Status

Ready

### Provider

GFZ Helmholtz Centre for Geosciences (GFZ)

### Portal Entry Point

https://swe.ssa.esa.int/gfz-g153b-federated

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## G.153c Hp60 and ap60 index archive

### Description

In this product, yearly downloadable files of the Hp60 and ap60 index are given back to 1995. The index values are given in one line per 60 minutes. Each file has a header with 30 lines, all starting with #. Non-existing values are indicated by -1.000 for Hp60 and -1 for ap60. ap60 values (a linear scale) are derived from Hp60. The Hp60 values are calculated at GFZ from near real-time geomagnetic observatory data provided by the contributing observatories. Values of Hp60 and ap60 are typically made available at the end of the measurement interval.

### Status

Ready

### Provider

GFZ Helmholtz Centre for Geosciences (GFZ)

### Portal Entry Point

https://swe.ssa.esa.int/gfz-g153c-federated

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## G.154a Nowcast Hp30 index

### Description

This product shows the 30-minutes nowcast Hp30 index of global geomagnetic activity during the present UTC day as a bar plot. The height of the bar(s) corresponds to the index value (0 to open-end) and the colour represents the geomagnetic activity level: Low - green (Hp30 < 3.3), Intermediate - yellow (3 < Hp30 < 6.3), High - red (Hp30 > 6). A smaller version of this plot is given for the preceding 6 days. The nowcast Hp60 values are calculated at GFZ from near real-time geomagnetic observatory data provided by the contributing observatories. Nowcast values of Hp30 are typically made available shortly before or after the end of the measurement interval.

### Status

Ready

### Provider

GFZ Helmholtz Centre for Geosciences (GFZ)

### Portal Entry Point

https://swe.ssa.esa.int/gfz-g154a-federated

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## G.154b Hp30 and ap30 index in tabular form

### Description

This product shows a table of the nowcast Hp30 and ap30 index of global geomagnetic activity for the present day and the preceding 14 days. Hp30 and ap30 are 30-minute indices. The index values are given in one line per day in the 3-hourly interval as for Kp index but instead of one value, six values are provided for each 3-hour interval, from top to bottom. Non-existing values are indicated by -1.000 for Hp30 and -1 for ap30. Below the table, there is a link to a downloadable ASCII-file (that has 30 header lines, all starting with #) representing the information for the present and the preceding 28 days. ap30 values (a linear scale) are derived from Hp30. The Hp30 values are calculated at GFZ from near real-time geomagnetic observatory data provided by the contributing observatories. Values of Hp30 and ap30 are typically made available at the end of the measurement interval.

### Status

Ready

### Provider

GFZ Helmholtz Centre for Geosciences (GFZ)

### Portal Entry Point

https://swe.ssa.esa.int/gfz-g154b-federated

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## G.154c Hp30 and ap30 index archive

### Description

In this product, yearly downloadable files of the Hp30 and ap30 index are given back to 1995. The index values are given in one line per 30 minutes. Each file has a header with 30 lines, all starting with #. Non-existing values are indicated by -1.000 for Hp30 and -1 for ap30. ap30 values (a linear scale) are derived from Hp30. The Hp30 values are calculated at GFZ from near real-time geomagnetic observatory data provided by the contributing observatories. Values of Hp30 and ap30 are typically made available at the end of the measurement interval.

### Status

Ready

### Provider

GFZ Helmholtz Centre for Geosciences (GFZ)

### Portal Entry Point

https://swe.ssa.esa.int/gfz-g154c-federated

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## G.155 Human global geomagnetic activity forecast for next 3 days

### Description

The BGS human global geomagnetic activity forecast is a text-based forecast for the next three 24-hour periods from noon to noon (UTC), put together by the forecaster on duty.

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g155-federated

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### G.156 Geomagnetic activity alert

#### Description

Automatic alerts from BGS magnetic observatories when geomagnetic activity levels exceed set activity thresholds.

#### Status

Ready

#### Provider

British Geological Survey (BGS)

#### Portal Entry Point

https://swe.ssa.esa.int/BGS-g156-federated

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### G.157 Regional auroral activity index, Finland

#### Description

Geomagnetic index characterizing auroral occurrence probability.

#### Status

Ready

#### Provider

Space and Earth Observation Centre (FMI)

#### Portal Entry Point

https://swe.ssa.esa.int/fmi-g157-federated

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### G.158 SIDC 3-day K-Belgium forecast

#### Description

The forecaster on duty at the SIDC produces each day (nominal issue time 12:30 UTC) a forecast of the value of the K-index in Belgium, for time periods of 3 hours. The forecast covers the period of three days, starting from the day of the issue of forecast at 12:00 UTC, and the two consecutive days at 00:00 UTC. Note that the three first values reported at 03:00 UTC, 06:00 UTC, and 09:00 UTC correspond to the measured values.

#### Status

Ready

### Provider

Solar Influences Data analysis Center (SIDC)

### Portal Entry Point

https://swe.ssa.esa.int/sidc-G158-federated

---

## G.159 GIC indicator plots for Greenland and Northern Europe

### Description

The GIC indicator plots of the rate of change of several magnetometer stations in Greenland and Northern Europe. The plots show dH/dt, dD/dt and dZ/dt and help the user to monitor those geomagnetic conditions that could induce unwanted currents in power grids.

### Status

Ready

### Provider

DTU Space (DTU)

### Portal Entry Point

https://swe.ssa.esa.int/dMAG_dt-federated

---

## G.160 Geomagnetic activity index for the auroral zone, Narsarsuaq

### Description

The AZ index is a 33 days archive product provided by DTU, indicating the average deviation from its 24h running mean value in the horizontal intensity of the magnetic field in the auroral zone every hour.

### Status

Ready

### Provider

DTU Space (DTU)

### Portal Entry Point

https://swe.ssa.esa.int/dtu-az-federated

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### G.161 Aurora Nowcast, Greenland

#### Description

The map show the latest estimated position of the polar ionospheric electrojet, and thus the auroral ovals over Greenland. Additionally a local model of the auroral oval is shown in turquoise (when the magnetic field is active).

#### Status

Ready

#### Provider

DTU Space (DTU)

#### Portal Entry Point

https://swe.ssa.esa.int/dtu-aurora-federated

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### G.163 Real-time one-minute Dst (ASC) as estimated using Ascension Island data

#### Description

Dst (Disturbance Storm Time) is an index of magnetic activity designed to measure the intensity of the global equatorial electrojet, also known as the ring current.

#### Status

Ready

#### Provider

British Geological Survey (BGS)

#### Portal Entry Point

https://swe.ssa.esa.int/BGS-g163-federated

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### G.164 3-hourly Telluric index (Lerwick, Eskdalemuir, Hartland)

#### Description

The telluric, or geo-electric field, index is a measure of disturbance in the horizontal components of the geo-electric field over a 3-hourly interval at each observatory.

#### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g164-federated

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## G.165 GIC Index, Bgic for the UK

### Description

The BGS GIC index, Bgic, is a measure of geomagnetic activity designed to indicate the level of geomagnetically induced current (GIC) in the UK power grid.

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g165-federated

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## G.166 Auroral images (Scotland)

### Description

A selection of auroral images captured using experimental aurora cameras installed at Lerwick Observatory in the Shetland Islands, Northern Scotland and Eskdalemuir Observatory in the Scottish Borders, Southern Scotland.

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g166-federated

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## G.167 Modelled surface electric field for UK and Ireland

### Description

Modelled surface electric field displayed on a map of UK and Ireland as an indicator of space weather hazard to power, pipe-line and rail networks, and overlaid with measured electric field at three UK observatory locations, see BGS product G.140 Horizontal electric field data (UK).

### Status

Ready

### Provider

British Geological Survey (BGS)

### Portal Entry Point

https://swe.ssa.esa.int/BGS-g167-federated

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## G.168 Regional Magnetograms

### Description

The product show magnetograms from a large number of ground based magnetometer stations, provided by several institutes. The magnetograms are divided in groups by magnetic latitude and magnetic longitude, enabling the user to explore the dynamic geomagnetic signatures in both the East-West and the North-South direction.

### Status

Ready

### Provider

DTU Space (DTU)

### Portal Entry Point

https://swe.ssa.esa.int/reg-mag-federated

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## G.169 Auroral indices from Kiruna

### Description

Auroral indices derived from IRF Kiruna digital all-sky camera for both real-time and from archive with 1-minute resolution.

### Status

Ready

### Provider

Swedish Institute of Space Physics (IRF)

### Portal Entry Point

https://swe.ssa.esa.int/irf-ai2022-federated

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## G.170 Automatic auroral recognition, Finland

### Description

The product shows near-real-time Allsky Camera (ASC) images from the Kevo station in Northern Finland. The product detects the presence of aurora features in the images through an automatic auroral recognition routine.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Space and Earth Observation Centre (FMI)

### Portal Entry Point

https://swe.ssa.esa.int/fmi-g170-federated

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## G.171 ap Prediction

### Description

The product provides prediction of the ap index values in a 3 hours interval for the next 3 days with a maximum lead time of 72 hours.

### Status

Product provided for demonstration, not assigned to service.

### Provider

NKUA Cosmic Ray Group (ANeMoS)

### Portal Entry Point

https://swe.ssa.esa.int/ap_Prediction-federated

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## G.172 Local Disturbance indices for the Iberian Peninsula

### Description

The product provides plots displaying a quantification of the disturbance of the horizontal component of the geomagnetic field on the ground at three different locations of the Iberian Peninsula: UAH (University of Alcala), SFS (San Fernando Observatory) and COI (University of Coimbra Observatory). The magnetic disturbance is indicated in the vertical axis in units of nanoteslas (nT) and the time is indicated in the horizontal axis in Universal Time (UT).

### Status

Ready

### Provider

Universidad de Alcalá (UAH)

### Portal Entry Point

https://swe.ssa.esa.int/uah-ldis-federated

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## G.173 Local Current indices for the Iberian Peninsula

### Description

The product provides plots displaying the derivative of LDi (Local Disturbance index) at three different locations of the Iberian Peninsula: UAH (University of Alcala), SFS (San Fernando Observatory) and COI (University of Coimbra Observatory). The derivative is indicated in the vertical axis in units of nanoteslas per minute (nT/min) and the time is indicated in the horizontal axis in Universal Time (UT).

### Status

Ready

### Provider

Universidad de Alcalá (UAH)

### Portal Entry Point

https://swe.ssa.esa.int/uah-lcis-federated

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## G.174 Iberian Local Disturbance Map

### Description

The map displays the disturbance of the horizontal component of the geomagnetic field on the ground at the Iberian Peninsula.

### Status

Ready

### Provider

Universidad de Alcalá (UAH)

### Portal Entry Point

https://swe.ssa.esa.int/uah-ild-map-federated

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## G.175 Mid Latitude indices: Ring current (MID-R) and Electrojet (MID-E)

### Description

The product provides: the mid latitude Ring Current index (MID-R) the mid latitude Electrojet equivalent index (MID-E), the maximum and minimum values obtained from used observatories (MID-U and MID-L) colour-coded according to Magnetic Local Time and geographical location, the availability of the observatories data used to generate the indexes and interfaces.

### Status

Ready

### Provider

Universidad de Alcalá (UAH)

### Portal Entry Point

https://swe.ssa.esa.int/uah-mid-federated

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## G.176 Forecast of SYM-H and ASY-H indices

### Description

The SYM-H and ASY-H forecast product provides a one-hour and two-hour forecast for each index, as well as the historical values of the previous indices for the last day, computed by the University of Alcalá. Monitoring metric assesses the Mean Absolute Error (MAE, absolute difference between the predicted value and the actual value of the index) for each prediction horizon and index in nT, providing the MAE for the last day and last month for each forecasting horizon.

### Status

Ready

### Provider

Universidad de Alcalá (UAH)

### Portal Entry Point

https://swe.ssa.esa.int/uah-sym-h-for-federated

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## G.177 BIGG model geomagnetic perturbations

### Description

Latest forecasts of magnetic field perturbations (dB in H, E, and N components) [nT] at various virtual ground magnetometer stations. These forecasts are derived from the Space Weather Modelling Framework (SWMF) and Gorgon Global MHD models when real-time L1 solar wind data are available.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Imperial College London (Imperial)

### Portal Entry Point

https://swe.ssa.esa.int/uib-db-bigg-federated

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## G.178 BIGG model rate of change of the horizontal geomagnetic field

### Description

Latest forecasts of the rate of change of the horizontal magnetic field, dBH/dt (in nT/s), at various virtual ground magnetometer station locations. These forecasts are provided via the 'Bergen Imperial Global Geospace' (BIGG) modelling system drawing on the 'Space Weather Modelling Framework' (SWMF) and Gorgon Global MHD models when real-time L1 solar wind data are available.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Imperial College London (Imperial)

### Portal Entry Point

https://swe.ssa.esa.int/uib-dbdth-bigg-federated

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### G.179 BIGG model Kp

#### Description

Latest forecasts of the BIGG model Kp-like index. These forecasts are derived from the Space Weather Modelling Framework (SWMF) and Gorgon Global MHD models when real-time L1 solar wind data are available.

#### Status

Product provided for demonstration, not assigned to service.

#### Provider

Imperial College London (Imperial)

#### Portal Entry Point

https://swe.ssa.esa.int/uib-kp-bigg-federated

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### G.180 BIGG model SYM-H Index

#### Description

Latest forecasts of the BIGG model SYM-H index (high-resolution Dst, in nT). These forecasts are derived from the Space Weather Modelling Framework (SWMF) model when real-time L1 solar wind data are available.

#### Status

Product provided for demonstration, not assigned to service.

#### Provider

Imperial College London (Imperial)

#### Portal Entry Point

https://swe.ssa.esa.int/uib-symh-bigg-federated

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### G.181 BIGG model auroral electrojet indices

#### Description

Latest forecasts of the auroral electrojet indices (AE, AU, and AL, in nT). These forecasts are derived from the Space Weather Modelling Framework (SWMF) and Gorgon Global MHD models when real-time L1 solar wind data are available.

#### Status

Product provided for demonstration, not assigned to service.

### Provider

Imperial College London (Imperial)

### Portal Entry Point

https://swe.ssa.esa.int/uib-ae-bigg-federated

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## G.182 BIGG model subsolar magnetopause standoff distance

### Description

Latest forecasts of the subsolar magnetopause standoff distance (in Earth radii, Re). These forecasts are derived from the Space Weather Modelling Framework (SWMF) and Gorgon Global MHD models when real-time L1 solar wind data are available.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Imperial College London (Imperial)

### Portal Entry Point

https://swe.ssa.esa.int/uib-mpsd-bigg-federated

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## G.183 BIGG model magnetosphere overview

### Description

Latest forecasts of the magnetosphere overview. The plots are XZ slices of the magnetosphere showing the pressure (nPa). These forecasts are derived from the Space Weather Modelling Framework (SWMF) and Gorgon Global MHD models when real-time L1 solar wind data are available.

### Status

Product provided for demonstration, not assigned to service.

### Provider

Imperial College London (Imperial)

### Portal Entry Point

https://swe.ssa.esa.int/uib-slice-bigg-federated

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### G.184 BIGG model integrated joule heating

#### Description

Latest forecasts of integrated Joule heating over the Northern Hemisphere [GW]. These forecasts are derived from the Space Weather Modelling Framework (SWMF) and Gorgon Global MHD models when real-time L1 solar wind data are available.

#### Status

Product provided for demonstration, not assigned to service.

#### Provider

Imperial College London (Imperial)

#### Portal Entry Point

https://swe.ssa.esa.int/uib-jh-bigg-federated

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### G.185 Near Real-time GIC Modelling Across Europe

#### Description

EuroGIC provides near real-time modelling and historical simulations of geomagnetically induced currents (GICs) in European transmission networks. It allows users to explore how GICs may impact power systems and investigate potential risks. The simulations use a representative grid, providing insight into possible effects during space weather events.

#### Status

Product provided for demonstration, not assigned to service.

#### Provider

British Geological Survey (BGS)

#### Portal Entry Point

https://swe.ssa.esa.int/eurogic-g185-federated

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# Part 2: Expert Groups

## Expert group contribution per ESC

The second part of this document gathers contact details of the product providers.
The list of expert group providing products to the SWE Network is listed in the table here below together with their contribution to each ESC.

| | S-ESC | H-ESC | R-ESC | I-ESC | G-ESC |
|---|---|---|---|---|---|
| BIRA-IASB Space Weather Services (BIRA-IASB) | | | 7 | | |
| British Antarctic Survey (UKRI/BAS) | | | 16 | | |
| British Geological Survey (BGS) | | | | | 24 |
| Catania Astrophysical Observatory (INAF/OACT) | 3 | | | | |
| Center for Space Radiations (UCLouvain/CSR) | | | 17 | | |
| Centre de Données de la Physique des Plasmas (CDPP) | | 3 | | | |
| Centre for mathematical Plasma-Astrophysics (KUL/CmPA) | | 1 | | | |
| Collecte Localisation Satellites (CNES/CLS) | 1 | | | | |
| Department Radiation Biology (DLR-IAM) | | | 4 | | |
| DTU Space (DTU) | | 3 | | | 8 |
| Eötvös Loránd University (ELTE) | | | 6 | | |
| German Aerospace Center (DLR) | | | | 10 | |
| GFZ Helmholtz Centre for Geosciences (GFZ) | | | | 5 | 13 |
| Heliogeophysical Prediction Service Laboratory (SRC PAS) | | | | 7 | |
| Imperial College London (Imperial) | | | | | 8 |
| Infor'marty (Infor'marty) | | 3 | | | |
| Institut de recherche sur les lois fondamentales de l'Univers (CEA/IRFU) | 1 | | | | |
| Institute for Astronomy, Astrophysics, Space Applications & Remote Sensing (NOA/IAASARS) | | | 3 | | |
| Institute for Astronomy, Astrophysics, Space Applications & Remote Sensing (NOA/IAASARS) | 1 | | | | |
| Institute for Data Science (FHNW/I4DS) | 2 | | | | |
| Institute of Physics (UNIGRAZ/IGAM) | | 4 | | 1 | |
| Institute of Space Science Romania (ISS Romania) | | | | 1 | |
| Ionospheric Group of the National Observatory of Athens (NOA) | | | | 19 | |
| Istituto Nazionale di Geofisica e Vulcanologia (INGV) | | | | 6 | |
| Kanzelhöhe Observatory for Solar and Environmental Research (UNIGRAZ/KSO) | 7 | | | | |

| | S-ESC | H-ESC | R-ESC | I-ESC | G-ESC |
|---|---|---|---|---|---|
| Mullard Space Science Laboratory (UCL/MSSL) | | | 3 | | |
| Multi Experiment Data & Operation Center (UPSaclay/MEDOC) | 4 | | | | |
| NKUA Cosmic Ray Group (NKUA/ANeMoS) | | | 3 | | 1 |
| Norwegian Mapping Authority (NMA) | | | | 8 | |
| Paul Buehler (PB) | | | 5 | | |
| Seibersdorf Laboratories (SL) | | | 1 | | |
| Solar Influences Data analysis Center (ROB/SIDC) | 24 | | | | 1 |
| Solar Patrol Service (ASU CAS/SPS) | 5 | | | | |
| Space and Earth Observation Centre (FMI) | | | | 2 | 6 |
| Space Applications & Research Consultancy (SPARC) | | | 6 | | |
| Space Environment and Radio Engineering Group (UoB/SERENE) | | | | 6 | |
| Space Radiative Environment Research Group (ONERA/ERS) | | | 15 | | |
| Space Research Laboratory, Department of Physics and Astronomy, University of Turku (UTU/SRL) | | | 6 | | |
| Starion UK Limited (Starion) | | | | | 1 |
| STFC, RAL Space (STFC/RAL Space) | | 15 | | | |
| Swedish Institute of Space Physics (IRF) | | | | | 6 |
| Turin Astrophysical Observatory (INAF/OATO) | | 2 | | | |
| UK Met Office (UKMO) | 2 | 15 | 16 | 1 | |
| Universidad de Alcalá (UAH) | | | | | 13 |
| University of Bergen (UiB) | | | | | 8 |
| University of Oslo (UiO) | | | | 4 | |
| UPC-IonSAT (UPC/IonSAT) | | | | 6 | |

Expert Group Details

## BIRA-IASB Space Weather Services

### Homepage

### Affiliation

Avenue Circulaire 3
1180 Uccle
Belgium

### Contribution to the ESA SWE network

Space radiation (7)

### Portal Entry Point

https://sepem.ssa-swe.eu/
https://spenvis.ssa-swe.eu
https://swe.ssa.esa.int/web/guest/bira-swiff-federated

### Products

| Code | Name |
|---|---|
| R.103 | Space Environment Information System (SPENVIS) |
| R.134a | SEPForecast |
| R.135 | Solar Energetic Particle Environment Modelling (SEPEM) |
| R.136 | SWIFF Plasmasphere (SPM) electron density and temperature distribution model |
| R.178 | Internal charging environment and analysis report |
| R.179 | Internal charging environment nowcast |
| R.180 | Internal charging environment forecast |

## British Antarctic Survey (BAS)

### Homepage

https://www.bas.ac.uk/

### Affiliation

High Cross, Madingley Road
Cambridge CB3 0ET
United Kingdom

### Contribution to the ESA SWE network

Space radiation (16)

### Portal Entry Point

https://swe.ssa.esa.int/sarif-federated

### Products

| Code | Name |
|---|---|
| R.142 | SaRIF Risk Indicator Panel |
| R.143 | SaRIF GOES-16 Internal Charging Current |
| R.144 | SaRIF GOES-16 Total Ionising Dose and Dose Rate |
| R.145 | SaRIF GOES-16 Radiation Environment |
| R.146 | SaRIF GOES-14 Internal Charging Current |
| R.147 | SaRIF GOES-14 Total Ionising Dose and Dose Rate |
| R.148 | SaRIF GOES-14 Radiation Environment |
| R.149 | SaRIF GIOVE-A Internal Charging Current |
| R.150 | SaRIF GIOVE-A Total Ionising Dose and Dose Rate |
| R.151 | SaRIF GIOVE-A Radiation Environment |
| R.152 | SaRIF Slot Region Internal Charging Current |
| R.153 | SaRIF Slot Region Total Ionising Dose and Dose Rate |
| R.154 | SaRIF Slot Region Radiation Environment |
| R.155 | MOSWOC high energy electron forecast for geostationary orbit |
| R.156 | MOSWOC Forecaster Summary |
| R.157 | SaRIF Best Reconstruction of the Radiation Environment |

## British Geological Survey (BGS)

### Homepage

https://geomag.bgs.ac.uk/

### Affiliation

Nicker Hill, Keyworth, NG12 5GG
Nottingham
United Kingdom

## Contribution to the ESA SWE network

Geomagnetic conditions (24)

## Portal Entry Point

## Products

| Code | Name |
|---|---|
| G.136 | 3-hourly K index: Lerwick, Eskdalemuir, Hartland |
| G.137a | Global activity indices nowcasts (aa) |
| G.137b | Global activity indices nowcasts (Kp) |
| G.137c | Global activity indices nowcasts (ap) |
| G.137d | Global activity indices nowcasts (Aa) |
| G.137e | Global activity indices nowcasts (Ap) |
| G.138 | ap index forecast: 3 hourly values, 3 day forecast window |
| G.139 | Ap index forecast: daily values, 27 day forecast window |
| G.140 | Horizontal electric field data (UK) |
| G.141 | 3-hourly K(GBI) index |
| G.142 | K(GBI) forecast: 3 hourly values, 3 day forecast window |
| G.143 | Horizontal magnetic rate of change (UK) |
| G.148 | Peak Geomagnetically Induced Current (GIC) for Scotland, England, Wales and the UK |
| G.149 | Average Geomagnetically Induced Current (GIC) for Scotland, England, Wales and the UK |
| G.150 | Peak Pipe-to-Soil Potential (PSP) for Scotland, England, Wales and the UK |
| G.151 | Average Pipe-to-Soil Potential (PSP) for Scotland, England, Wales and the UK |
| G.155 | Human global geomagnetic activity forecast for next 3 days |
| G.156 | Geomagnetic activity alert |
| G.163 | Real-time one-minute Dst (ASC) as estimated using Ascension Island data |
| G.164 | 3-hourly Telluric index (Lerwick, Eskdalemuir, Hartland) |
| G.165 | GIC Index, Bgic for the UK |
| G.166 | Auroral images (Scotland) |
| G.167 | Modelled surface electric field for UK and Ireland |

| Code | Name |
|---|---|
| G.185 | Near Real-time GIC Modelling Across Europe |

## Catania Astrophysical Observatory (OACT)

### Homepage

http://www.oact.inaf.it/

### Affiliation

Via S. Sofia 78
95123 Catania
Italy

### Contribution to the ESA SWE network

Solar weather (3)

### Portal Entry Point

### Products

| Code | Name |
|---|---|
| S.121 | INAF/OACT White light Solar images |
| S.122 | INAF/OACT Halpha Solar images |
| S.123a | INAF/OACT Sunspot group characteristics |

## Center for Space Radiations (CSR)

### Homepage

http://web.csr.ucl.ac.be

### Affiliation

3 Place du Levant
B-1348 Louvain-la-Neuve
Belgium

### Contribution to the ESA SWE network

Space radiation (17)

### Portal Entry Point

https://swe.ssa.esa.int/web/guest/csr-ept-federated

## Products

| Code | Name |
|---|---|
| R.109 | PROBA-V/EPT Electron flux spectra time series |
| R.110 | PROBA-V/EPT Proton flux spectra time series |
| R.111 | PROBA-V/EPT Helium flux spectra time series |
| R.112 | PROBA-V/EPT Electron flux geographical maps |
| R.113 | PROBA-V/EPT Proton flux geographical maps |
| R.114 | PROBA-V/EPT Helium flux geographical maps |
| R.115 | PROBA-V/EPT Auroral electron energy spectrum characterisation |
| R.116 | PROBA-V/EPT SAA proton energy spectrum characterisation |
| R.117 | PROBA-V/EPT SAA helium energy spectrum characterisation |
| R.139 | Static radiation model of energetic electrons at LEO |
| R.140 | Static radiation model of energetic protons at LEO |
| R.141 | Static radiation model of energetic helium ions at LEO |
| R.160 | PROBA-V/EPT High-latitude/polar electron flux survey |
| R.161 | PROBA-V/EPT High-latitude/polar proton flux survey |
| R.162 | PROBA-V/EPT High-latitude/polar helium flux survey |
| R.167 | PROBA-V/EPT Total ionizing dose estimation at LEO |
| R.168 | PROBA-V/EPT Total non-ionizing dose estimation at LEO |

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## Centre de Données de la Physique des Plasmas (CDPP)

### Homepage

http://www.cdpp.eu

### Affiliation

9, avenue du Colonel Roche
31028 Toulouse Cedex 4
France

### Contribution to the ESA SWE network

Heliospheric weather (3)

### Portal Entry Point

https://swe.ssa.esa.int/cdpp-amda-federated
https://swe.ssa.esa.int/cdpp-heliopropa-federated
https://swe.ssa.esa.int/cdpp-proptol-federated

### Products

| Code | Name |
|---|---|
| H.103c | Heliospheric propagation tool |
| H.107b | Solar wind propagation (Heliopropa) |
| H.114a | Automated Multi Dataset Analysis (AMDA) |

## Centre for mathematical Plasma-Astrophysics (CmPA)

### Homepage

https://wis.kuleuven.be/CmPA

### Affiliation

Oude Markt 13
3000 Leuven
Belgium

### Contribution to the ESA SWE network

Heliospheric weather (1)

### Portal Entry Point

https://swe.ssa.esa.int/kul-cmpa-federated

### Products

| Code | Name |
|---|---|
| H.200a | Virtual Space Weather Modelling Centre |

## Collecte Localisation Satellites (CLS)

### Homepage

https://www.cls.fr/

### Affiliation

11, rue Hermès
31520 Ramonville Saint-Agne
France

### Contribution to the ESA SWE network

Solar weather (1)

### Portal Entry Point

### Products

| Code | Name |
|---|---|
| S.508b | CLS F10.7 and F30 nowcast & forecast |

## Department Radiation Biology (DLR-IAM)

### Homepage

http://www.dlr.de/me/en/desktopdefault.aspx/tabid-1933/

### Affiliation

Linder Hoehe
51147 Koeln
Germany

### Contribution to the ESA SWE network

Space radiation (4)

### Portal Entry Point

https://swe.ssa.esa.int/web/guest/dlr-iam-federated
https://swe.ssa.esa.int/web/guest/dlr-iam2-federated

### Products

| Code | Name |
|---|---|
| R.123 | Radiation environment outside the ISS (RADSpace) |
| R.124 | Radiation environment inside the ISS (RADSpace) |
| R.125 | Accumulated dose in human phantoms onboard the ISS (RADSpace) |
| R.127 | SEP Post-event analysis for aviation radiation exposure (RADSEP) |

## DTU Space (DTU)

### Homepage

https://www.space.dtu.dk/english

### Affiliation

Akademivej building 356
DK-2800 Kgs. Lyngby
Denmark

### Contribution to the ESA SWE network

Heliospheric weather (3)
Geomagnetic conditions (8)

### Portal Entry Point

https://swe.ssa.esa.int/dtu-aware-a-federated
https://swe.ssa.esa.int/dtu-aware-federated
https://swe.ssa.esa.int/dtu-aware-next-federated
https://swe.ssa.esa.int/web/guest/StormRisk24-federated
https://swe.ssa.esa.int/web/guest/dMAG_dt-federated
https://swe.ssa.esa.int/web/guest/dtu-aurora-federated
https://swe.ssa.esa.int/web/guest/dtu-az-federated
https://swe.ssa.esa.int/web/guest/dtu-k-federated
https://swe.ssa.esa.int/web/guest/dtu-pcn-federated
https://swe.ssa.esa.int/web/guest/nrt-mag-federated
https://swe.ssa.esa.int/web/guest/reg-mag-federated

### Products

| Code | Name |
|---|---|
| G.101 | Magnetogrammes from North(West) Europe and Greenland |
| G.102 | K-index from magnetometer stations in north Europe |
| G.144 | PCN index |
| G.147 | Storm risk next 24h |
| G.159 | GIC indicator plots for Greenland and Northern Europe |
| G.160 | Geomagnetic activity index for the auroral zone, Narsarsuaq |
| G.161 | Aurora Nowcast, Greenland |
| G.168 | Regional Magnetograms |
| H.101f | AWARE_NEXT Enhanced 24 hour solar wind forecast |

| Code | Name |
|---|---|
| H.106b | Automated WARnings of Earth arrivals (AWARE) |
| H.110b | Automated WARnings of STEREO_A arrivals (AWARE_A) |

## Eötvös Loránd University (ELTE)

### Homepage

https://www.elte.hu/

### Affiliation

Egyetem tér 1-3
Budapest
Hungary

### Contribution to the ESA SWE network

Space radiation (6)

### Portal Entry Point

https://swe.ssa.esa.int/elte-plasma-federated

### Products

| Code | Name |
|---|---|
| R.221 | Plasma density measurements (PLASMA) |
| R.222 | Plasmapause Location Limits measurements (PLASMA) |
| R.223 | Empirical Plasmapause Maps/plasmapause limits (PLASMA) |
| R.224 | Plasmasphere Index (PLASMA) |
| R.225 | Midnight Plasmapause Proxy (PLASMA) |
| R.226 | 2-D Electron Density Maps (PLASMA) |

## German Aerospace Center (DLR)

### Homepage

https://www.dlr.de/EN/Home/home_node.html

### Affiliation

Linder Höhe
51147 Cologne
Germany

### Contribution to the ESA SWE network

Ionospheric weather (10)

### Portal Entry Point

https://swe.ssa.esa.int/impc-federated
https://swe.ssa.esa.int/web/guest/GPI-federated

### Products

| Code | Name |
|---|---|
| I.101b | Near-real-time map of the Total Electron Content (TEC) for the European region |
| I.102b | Forecast of the Total Electron Content (TEC) for the European region. |
| I.103b | Near-real-time global map of the Total Electron Content (TEC) |
| I.104b | Forecast of the Total Electron Content (TEC) worldwide. |
| I.105a | Equivalent slab thickness for Juliusruh |
| I.105b | Equivalent slab thickness for Pruhonice |
| I.106 | Global Scintillation Indices |
| I.124 | The Rate of change of TEC index (ROTI) maps for Europe |
| I.138 | GNSS Performance Indicator |
| I.139 | Maximum Usable Frequency for skip-distances of 750 km (MUF750) |

## GFZ Helmholtz Centre for Geosciences (GFZ)

### Homepage

https://www.gfz.de/en/

### Affiliation

Telegrafenberg
14473 Potsdam
Germany

## Contribution to the ESA SWE network

Ionospheric weather (5)
Geomagnetic conditions (13)

## Portal Entry Point

https://swe.ssa.esa.int/web/guest/gfz-kp-federated
https://swe.ssa.esa.int/web/guest/gfz-sua-g-federated
https://swe.ssa.esa.int/web/guest/gfz-sua-i-federated

## Products

| Code | Name |
|---|---|
| G.107 | Nowcast Kp index |
| G.108 | Most recent definitive Kp index |
| G.109 | Kp and Ap index on tabular form |
| G.110 | Kp and Ap index archive |
| G.123 | Swarm Polar Electrojet (PEJ) |
| G.124 | Swarm Field-Aligned Current (FAC) |
| G.125 | Swarm Vector Magnetic Field (MAG) |
| G.153a | Nowcast Hp60 index |
| G.153b | Hp60 and ap60 index in tabular form |
| G.153c | Hp60 and ap60 index archive |
| G.154a | Nowcast Hp30 index |
| G.154b | Hp30 and ap30 index in tabular form |
| G.154c | Hp30 and ap30 index archive |
| I.128 | Swarm Rate Of change of TEC (ROT) |
| I.129 | Swarm Total Electron Content (TEC) |
| I.130 | Swarm electron density (Ne) |
| I.131 | Swarm Ionospheric Bubble Index (IBI) |
| I.141 | Swarm Rate Of change of TEC Index (ROTI) |

## Heliogeophysical Prediction Service Laboratory (SRC PAS)

### Homepage

http://rwc.cbk.waw.pl/

### Affiliation

Bartycka 18A
00-716 Warsaw
Poland

### Contribution to the ESA SWE network

Ionospheric weather (7)

### Portal Entry Point

https://swe.ssa.esa.int/web/guest/SRC_RIO-federated
https://swe.ssa.esa.int/web/guest/src-federated

### Products

| Code | Name |
|---|---|
| I.125 | Past values of solar activity indices used in atmosphere models |
| I.126 | Past values of geomagnetic activity indices used in atmosphere models |
| I.134a | Borowiec Riometer raw [V] and relative [dB] |
| I.134b | Hornsund riometer measurements |
| I.134c | Pallas riometer measurements |
| I.159 | Polar Radio Link |
| I.160 | Absorption alerts at 30 MHz and 38 MHz |

## Imperial College London (Imperial)

### Homepage

https://www.imperial.ac.uk/

### Affiliation

London
United Kingdom

### Contribution to the ESA SWE network

Geomagnetic conditions (8)

## Portal Entry Point

## Products

| Code | Name |
|---|---|
| G.177 | BIGG model geomagnetic perturbations |
| G.178 | BIGG model rate of change of the horizontal geomagnetic field |
| G.179 | BIGG model Kp |
| G.180 | BIGG model SYM-H Index |
| G.181 | BIGG model auroral electrojet indices |
| G.182 | BIGG model subsolar magnetopause standoff distance |
| G.183 | BIGG model magnetosphere overview |
| G.184 | BIGG model integrated joule heating |

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### Infor'marty (Infor'marty)

## Homepage

https://www.informarty.fr/

## Affiliation

152 chemin de la planquette
81370 Saint Sulpice la pointe
France

## Contribution to the ESA SWE network

Heliospheric weather (3)

## Portal Entry Point

https://swe.ssa.esa.int/informarty-magctool-federated
https://swe.ssa.esa.int/informarty-shocktool-federated
https://swe.ssa.esa.int/informarty-swift-federated

## Products

| Code | Name |
|---|---|
| H.101i | Solar Wind Flux Tube (SWiFT) forecast |
| H.109a | Magnetic Connectivity Tool |
| H.109b | Shock tool |

## Institut de recherche sur les lois fondamentales de l'Univers (IRFU)

### Homepage

https://irfu.cea.fr/

### Affiliation

France

### Contribution to the ESA SWE network

Solar weather (1)

### Portal Entry Point

### Products

| Code | Name |
|---|---|
| S.042a | Solar Magnetic Activity Forecasting |

## Institute for Astronomy, Astrophysics, Space Applications & Remote Sensing (IAASARS)

### Homepage

https://www.astro.noa.gr

### Affiliation

Vas. Pavlou & I. Metaxa
GR-15 236 Penteli
Greece

### Contribution to the ESA SWE network

Space radiation (3)

### Portal Entry Point

https://swe.ssa.esa.int/noa-hesperia-federated

### Products

| Code | Name |
|---|---|
| R.158 | HESPERIA RELeASE |
| R.159 | HESPERIA UMASEP-500 |
| R.163 | HESPERIA RELeASE Alert |

## Institute for Astronomy, Astrophysics, Space Applications & Remote Sensing (IAASARS)

### Homepage

https://www.astro.noa.gr/

### Affiliation

Vas. Pavlou & I. Metaxa
GR-15 236 Penteli
Greece

### Contribution to the ESA SWE network

Solar weather (1)

### Portal Entry Point

### Products

| Code | Name |
|---|---|
| S.124 | A-EFFort Solar flare forecast |

## Institute for Data Science (I4DS)

### Homepage

https://www.fhnw.ch/en/about-fhnw/schools/school-of-engineering/institutes/institute-for-data-science

### Affiliation

Switzerland

### Contribution to the ESA SWE network

Solar weather (2)

### Portal Entry Point

### Products

| Code | Name |
|---|---|
| S.105b | eCallisto Solar radio spectrograms |
| S.109e | FLARECAST Solar flare forecast |

## Institute of Physics (IGAM)

### Homepage

https://physik.uni-graz.at/en/

### Affiliation

Universitätsplatz 3
8010 Graz
Austria

### Contribution to the ESA SWE network

Heliospheric weather (4)
Ionospheric weather (1)

### Portal Entry Point

https://swe.ssa.esa.int/graz-dbem-federated
https://swe.ssa.esa.int/graz-eswf-federated
https://swe.ssa.esa.int/graz-eswf24-federated
https://swe.ssa.esa.int/graz-stereo-ch-federated
https://swe.ssa.esa.int/soda-federated

### Products

| Code | Name |
|---|---|
| H.101b | Forecast of solar wind high-speed streams (ESWF) |
| H.101e | Forecast of solar wind high-speed streams (STEREO+CH) |
| H.101h | Forecast of solar wind high-speed streams ESWF24 |
| H.108b | CME arrival time predictions (Drag Based Ensemble Model Tool) |
| I.161 | Satellite Orbit DecAy (SODA) Neutral density forecast |

## Institute of Space Science Romania (ISS Romania)

### Homepage

https://www2.spacescience.ro/?lang=en

### Affiliation

409, Atomistilor Street
Magurele, Ilfov
Romania

### Contribution to the ESA SWE network

Ionospheric weather (1)

### Portal Entry Point

https://swe.ssa.esa.int/web/guest/forind-federated

### Products

| Code | Name |
|---|---|
| I.133 | Nowcasts and Forecasts of Geomagnetic and Solar Indices Needed for Atmospheric Modelling in Support of Atmospheric Drag Calculation. |

## Ionospheric Group of the National Observatory of Athens (NOA)

### Homepage

http://www.iono.noa.gr

### Affiliation

Lofos Nymfon, Thissio
GR-11851 Athens
Greece

### Contribution to the ESA SWE network

Ionospheric weather (19)

### Portal Entry Point

https://swe.ssa.esa.int/web/guest/dias-federated
https://swe.ssa.esa.int/web/guest/techtide-federated

### Products

| Code | Name |
|---|---|
| I.114 | Long term prediction (up to 3 month ahead) of foF2, European maps based on the upgraded SIRM model |
| I.115 | Nowcast European maps of foF2 (based on the upgraded SIRMUP model ) |
| I.116 | Maps of forecasted foF2 over Europe for the next 24 hours, (based on SWIF and GCAM models) |
| I.117 | Near-real-time TEC maps for the European region (based on the TaD model) |
| I.118 | Alerts for ionospheric disturbances in the European sector (based on the Alert Algorithm of the SWIF model) |
| I.119 | Maps, updated in real-time showing the current ionospheric conditions at each station location. |

| Code | Name |
|---|---|
| I.120 | Forecast foF2 values for the next 24 hours over each DIAS ionosonde station, based on the SWIF and on the GCAM models |
| I.140 | Near real-time maps of hmF2 for the European region |
| I.142 | TechTIDE ionospheric electron density perturbation maps |
| I.143 | TechTIDE GNSS TEC gradient |
| I.144 | TechTIDE LSTID detector maps |
| I.145 | TechTIDE LSTID parameters over station |
| I.146 | TechTIDE LSTID activity index |
| I.147 | TechTIDE AATR indicator maps |
| I.148 | TechTIDE AATR indicator daily plots |
| I.149 | TechTIDE Medium Scale Travelling Ionospheric Disturbances (MSTID) detection for Czech Republic, Doppler system based |
| I.150 | TechTIDE MSTID index maps |
| I.151 | TechTIDE MSTID index daily plots |
| I.152 | TechTIDE TID Activity Report |

## Istituto Nazionale di Geofisica e Vulcanologia (INGV)

### Homepage

https://www.ingv.it/it/

### Affiliation

Via di Vigna Murata 605, 00143
Rome
Italy

### Contribution to the ESA SWE network

Ionospheric weather (6)

### Portal Entry Point

https://swe.ssa.esa.int/web/guest/ingv-federated

## Products

| Code | Name |
|---|---|
| I.153 | Nowcasting of MUF(3000)F2 over Europe |
| I.154 | Nowcasting of MUF(3000)F2 ratio over Europe |
| I.155 | Short Term Forecasting of MUF(3000)F2 over Europe |
| I.156 | Short Term Forecasting of MUF(3000)F2 ratio over Europe |
| I.157 | Nowcasting of TEC over Italy |
| I.158 | Short Term Forecasting of TEC over Italy |

### Kanzelhöhe Observatory for Solar and Environmental Research (KSO)

#### Homepage

http://www.kso.ac.at/index_en.php

#### Affiliation

Universitätsplatz 3
8010 Graz
Austria

#### Contribution to the ESA SWE network

Solar weather (7)

#### Portal Entry Point

#### Products

| Code | Name |
|---|---|
| S.107a | UGraz/KSO Halpha Solar images |
| S.107c | UGraz/KSO Solar flare detections |
| S.107d | UGraz/KSO Solar flare alerts |
| S.107e | UGraz/KSO White light Solar images |
| S.107f | UGraz/KSO Solar filament detection |
| S.107g | UGraz/KSO Halpha light curves |
| S.107h | UGraz/KSO F10.7 and F30 forecasts |

## Mullard Space Science Laboratory (MSSL)

### Homepage

http://www.ucl.ac.uk/mssl

### Affiliation

UCL Mullard Space Science Laboratory, Holmbury House, Holmbury St Mary
Dorking, Surrey, RH5 6NT
United Kingdom

### Contribution to the ESA SWE network

Space radiation (3)

### Portal Entry Point

https://swe.ssa.esa.int/web/guest/mssl-federated

### Products

| Code | Name |
|---|---|
| R.131 | Electron population model at GEO |
| R.132 | Electron population model at MEO |
| R.133 | Electron population model at LEO |

## Multi Experiment Data & Operation Center (MEDOC)

### Homepage

https://idoc.ias.universite-paris-saclay.fr/MEDOC

### Affiliation

Paris
France

### Contribution to the ESA SWE network

Solar weather (4)

### Portal Entry Point

### Products

| Code | Name |
|---|---|
| S.005a | Synchronous synoptic maps of the photosphere |

| Code | Name |
|---|---|
| S.050a | Synchronous synoptic maps of the solar corona in the UV and extreme-UV |
| S.051a | Maps of the thermal structure of the solar corona |
| S.052a | Maps of electric currents in Active Region |

## NKUA Cosmic Ray Group (ANeMoS)

### Homepage

http://cosray.phys.uoa.gr

### Affiliation

Panepistimiopolis
15784 Ilissia
Greece

### Contribution to the ESA SWE network

Space radiation (3)
Geomagnetic conditions (1)

### Portal Entry Point

https://swe.ssa.esa.int/web/guest/anemos-federated
https://swe.ssa.esa.int/web/guest/ap_Prediction-federated
https://swe.ssa.esa.int/web/guest/dyastima-federated

### Products

| Code | Name |
|---|---|
| G.171 | ap Prediction |
| R.102 | GLE Alert++ service |
| R.108 | Multi-station neutron monitor data |
| R.137 | DYnamic Atmospheric Shower Tracking Interactive Model Application (DYASTIMA) |

## Norwegian Mapping Authority (NMA)

### Homepage

https://www.kartverket.no/en

### Affiliation

Kartverksveien 21
Hønefoss 3507
Norway

### Contribution to the ESA SWE network

Ionospheric weather (8)

### Portal Entry Point

https://swe.ssa.esa.int/web/guest/rtim-federated

### Products

| Code | Name |
|---|---|
| I.107 | VTEC maps (Northern Europe) |
| I.108 | GIVE maps (Northern Europe) |
| I.109a | ROTI maps (Northern Europe) |
| I.109b | ROTI@Ground maps (Fennoscandia) |
| I.110a | S4 maps (Northern Europe) |
| I.110b | σφ maps (Northern Europe) |
| I.110c | S4 maps |
| I.110d | σφ maps |

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## Paul Buehler (PB)

### Homepage

### Affiliation

Haspelmeistergasse 15
1140 Vienna
Austria

### Contribution to the ESA SWE network

Space radiation (5)

### Portal Entry Point

https://swe.ssa.esa.int/web/guest/pb-srem-federated

### Products

| Code | Name |
|---|---|
| R.118 | Time series of PROBA-1/SREM radiation rates |
| R.119 | Time series of Integral/SREM radiation rates |
| R.120 | Time series of Rosetta/SREM radiation rates |
| R.121 | Time series of Herschel/SREM radiation rates |
| R.122 | Time series of Planck/SREM radiation rates |

## Seibersdorf Laboratories (SL)

### Homepage

https://www.seibersdorf-laboratories.at/en/home

### Affiliation

TECH Campus Seibersdorf
2444 Seibersdorf
Austria

### Contribution to the ESA SWE network

Space radiation (1)

### Portal Entry Point

https://swe.ssa.esa.int/web/guest/avidos-federated

### Products

| Code | Name |
|---|---|
| R.101 | AVIDOS Radiation exposure estimation at aircraft altitude |

## Solar Influences Data analysis Center (SIDC)

### Homepage

http://www.sidc.be/

### Affiliation

Avenue Circulaire – Ringlaan, 3
1180 Brussels
Belgium

## Contribution to the ESA SWE network

Solar weather (24)
Geomagnetic conditions (1)

## Portal Entry Point

https://swe.ssa.esa.int/web/guest/sidc-G158-federated

## Products

| Code | Name |
|---|---|
| G.158 | SIDC 3-day K-Belgium forecast |
| S.101 | Proba2/SWAP Images |
| S.101c | SIDC Solarmap |
| S.102 | Proba2/LYRA Data |
| S.103 | SIDC/USET Halpha Solar images |
| S.104 | SIDC/USET White light Solar images |
| S.105a | SIDC Humain Callisto Solar radio spectrograms |
| S.105c | SIDC Automated Solar radio burst detections |
| S.105d | SIDC/Humain Solar radio light curves |
| S.106 | SDO/AIA Solar EUV images |
| S.108 | SIDC/SILSO International sunspot number |
| S.108b | SIDC/SILSO Sunspot number forecast |
| S.109a | SIDC 10.7cm Solar radio flux (F10.7) forecast |
| S.109b | SIDC Solar flare forecast |
| S.110 | SIDC Daily space weather bulletin |
| S.111 | SIDC/CACTus Automated CME detection |
| S.112a | SIDC Solar GOES-flare alert |
| S.112b | SIDC/CACTus Automated halo CME alert |
| S.112z | SIDC Human operator alert moderation |
| S.113 | SIDC All quiet alert |
| S.123b | SIDC/USET Sunspot group characteristics |
| S.126 | SIDC Automated coronal hole detection |

| Code | Name |
|---|---|
| S.127 | SIDC Solar EUV flare detection |
| S.600z | SIDC Moderated Solar Weather Event list |
| S.790a | ICAO Space Weather Advisory browser |

## Solar Patrol Service (SPS)

### Homepage

https://www.asu.cas.cz/~sunwatch/

### Affiliation

Czech Republic

### Contribution to the ESA SWE network

Solar weather (5)

### Portal Entry Point

### Products

| Code | Name |
|---|---|
| S.017a | ASUCAS/SPS White light Solar images |
| S.019a | ASUCAS/SPS Halpha Solar images |
| S.123d | ASUCAS/SPS Sunspot group characteristics |
| S.501a | ASUCAS/SPS Solar flare forecast |
| S.801a | ASUCAS/SPS Daily space weather bulletin |

## Space and Earth Observation Centre (FMI)

### Homepage

https://space.fmi.fi/

### Affiliation

Erik Palménin aukio 1
FI-00560 HELSINKI
Finland

### Contribution to the ESA SWE network

Ionospheric weather (2)
Geomagnetic conditions (6)

### Portal Entry Point

https://swe.ssa.esa.int/web/guest/fmi-federated
https://swe.ssa.esa.int/web/guest/fmi-tomoscand-federated

### Products

| Code | Name |
|---|---|
| G.106 | Aurora forecast service |
| G.111 | Maps for power and pipeline operators |
| G.112 | Table of modelled GIC |
| G.114 | Pipe-to-soil voltage (PSV) |
| G.157 | Regional auroral activity index, Finland |
| G.170 | Automatic auroral recognition, Finland |
| I.135a | TomoScand3D |
| I.135b | TomoScand2D |

## Space Applications & Research Consultancy (SPARC)

### Homepage

https://www.sparc.space/

### Affiliation

Aiolou 68
Athens
Greece

### Contribution to the ESA SWE network

Space radiation (6)

### Portal Entry Point

### Products

| Code | Name |
|---|---|
| R.170 | EDRS-C/NGRM L2 Electron differential fluxes |

| Code | Name |
|---|---|
| R.171 | EDRS-C/NGRM L2 Proton differential fluxes |
| R.172 | GEO electron integral flux alerts |
| R.173 | GEO proton flux alerts |
| R.174 | EDRS-C/NGRM Electron daily fluences |
| R.175 | GEO Multiple electron flux measurements |

## Space Environment and Radio Engineering Group (SERENE)

### Homepage

https://serene.bham.ac.uk/

### Affiliation

Birmingham
United kingdom

### Contribution to the ESA SWE network

Ionospheric weather (6)

### Portal Entry Point

### Products

| Code | Name |
|---|---|
| I.169 | AIDA Global Map Nowcasts of vertical Total Electron Content (vTEC) |
| I.170 | AIDA Global Map Forecasts of vertical Total Electron Content (vTEC) |
| I.171 | AIDA Global 3D Reconstruction Nowcasts of Electron Density (Ne) |
| I.172 | AIDA Global 3D Reconstruction Forecasts of Electron Density (Ne) |
| I.173 | AIDA Global Nowcasts of Ionospheric Parameters |
| I.174 | AIDA Global Forecasts of Ionospheric Parameters |

## Space Radiative Environment Research Group (ERS)

### Homepage

https://www.onera.fr/en/dphy/research-units#ers

### Affiliation

2, avenue Mark Pelegrin - BP 74025
31055 Toulouse CEDEX
France

### Contribution to the ESA SWE network

Space radiation (15)

### Portal Entry Point

https://swe.ssa.esa.int/onera-rb-fan-federated
https://swe.ssa.esa.int/onera-rb-ind-federated

### Products

| Code | Name |
|---|---|
| R.176 | RB-IND Radiation belt activity index for solar array degradation |
| R.177 | RB-IND Radiation belt activity indices for surface and internal charging |
| R.211 | RB-FAN Radiation Belts Orbits dedicated Risk Alert |
| R.212 | RB-FAN Radiation Belts Deep Charging Risk Alert |
| R.213 | RB-FAN Radiation Belts Solar Cell, SEE and Human Spaceflight Risk Alert |
| R.214 | RB-FAN Radiation Belts Satellite Internal Electric Potential |
| R.215 | RB-FAN Radiation Belts Solar Cell, SEE and Human Spaceflight R indexes |
| R.216 | RB-FAN Omnidirectional Differential Electron Flux |
| R.217 | RB-FAN Omnidirectional Differential Proton Flux |
| R.218 | RB-FAN Radiation Belts Quicklook Visualisations |
| R.219 | RB-FAN Radiation Belts Modular Bulletin |
| R.231 | RB-FAN Surface Charging No Risk Indicator |
| R.232 | RB-FAN Surface Charging No Risk Time Series |
| R.233 | RB-FAN SEP 24h Risk Alert |
| R.234 | RB-FAN SEP Total Fluence Forecast |

## Space Research Laboratory, Department of Physics and Astronomy, University of Turku (SRL)

### Homepage

http://www.srl.utu.fi

### Affiliation

FI-20014 University of Turku
Finland

### Contribution to the ESA SWE network

Space radiation (6)

### Portal Entry Point

https://swe.ssa.esa.int/web/guest/utu-srl-federated

### Products

| Code | Name |
|---|---|
| R.128 | Very high-energy Solar Energetic Particle environment mission specification: proton fluence |
| R.129 | Very high-energy Solar Energetic Particle environment mission specification: proton peak flux |
| R.130 | Solar Energetic Particle event catalogue: high-energy solar proton events |
| R.138 | High-energy Solar Energetic Particle environment mission specification: heavy ion fluence |
| R.165 | High-energy Solar Energetic Particle environment mission specification: heavy ion peak flux |
| R.166 | Very high-energy solar proton event database |

## Starion UK Limited (Starion)

### Homepage

https://www.stariongroup.eu/uk/

### Affiliation

Unit 3.04, Newark Works, 2 Foundry Way, South Quays
Bath BA2 3DZ
United Kingdom

### Contribution to the ESA SWE network

Geomagnetic conditions (1)

### Portal Entry Point

### Products

| Code | Name |
|---|---|
| G.185 | Near Real-time GIC Modelling Across Europe |

## STFC, RAL Space (RAL Space)

### Homepage

https://www.ralspace.stfc.ac.uk/Pages/Space-weather.aspx

### Affiliation

Oxfordshire
OX11 0QX
United Kingdom

### Contribution to the ESA SWE network

Heliospheric weather (15)

### Portal Entry Point

https://swe.ssa.esa.int/ral-swfsc-e-federated

### Products

| Code | Name |
|---|---|
| H.101g | Near-Earth solar wind forecasts (EUHFORIA) |
| H.101z | Solar Wind Forecast Speed Comparison |
| H.107c_Mars | Mars solar wind forecasts (EUHFORIA) |
| H.107c_Mercury | Mercury solar wind forecasts (EUHFORIA) |
| H.107c_Venus | Venus solar wind forecasts (EUHFORIA) |
| H.112a | H-ESC product assessment Report |
| H.113a | H-ESC archive product browser |
| H.115a | H-ESC statistical products |
| H.120a | STEREO-A HI Beacon Mode Background Subtracted Difference Movie |
| H.120b | STEREO-A HI Time Elongation J-Maps (Beacon Mode) |
| H.120c | STEREO-A HI Time Elongation Annotated J-Maps (Beacon Mode) |
| H.121a | STEREO-A HI Background Subtracted Movie (Science Mode) |
| H.121b | STEREO-A HI Background Subtracted Difference Movie (Science Mode) |
| H.121c | STEREO-A HI Time Elongation J-Map (Science Mode) |
| H.121d | STEREO-A HI J-Map Annotated (Science Mode) |

## Swedish Institute of Space Physics (IRF)

### Homepage

https://www.irf.se/

### Affiliation

Box 812, SE-981 28
Kiruna
Sweden

### Contribution to the ESA SWE network

Geomagnetic conditions (6)

### Portal Entry Point

https://swe.ssa.esa.int/irf-aurora-federated
https://swe.ssa.esa.int/irf-federated

### Products

| Code | Name |
|---|---|
| G.113 | Forecasts of dB/dt |
| G.134 | Forecast of Kp |
| G.135 | Forecast of Dst |
| G.145 | AE, AL and AU forecasts |
| G.146 | Auroral data from Kiruna |
| G.169 | Auroral indices from Kiruna |

## Turin Astrophysical Observatory (OATO)

### Homepage

https://www.oato.inaf.it/?lang=en

### Affiliation

Via Osservatorio, 20
10025 Pino Torinese TO
Italy

### Contribution to the ESA SWE network

Heliospheric weather (2)

### Portal Entry Point

https://swe.ssa.esa.int/inaf-cmeprop-federated
https://swe.ssa.esa.int/inaf-mageff-federated

### Products

| Code | Name |
|---|---|
| H.103d | Magnetic Effectiveness Tool |
| H.103e | CME propagation prediction tool |

## UK Met Office (UKMO)

### Homepage

https://www.metoffice.gov.uk/

### Affiliation

FitzRoy Road
Exeter
United Kingdom

### Contribution to the ESA SWE network

Solar weather (2)
Heliospheric weather (15)
Space radiation (16)
Ionospheric weather (1)

### Portal Entry Point

https://swe.ssa.esa.int/metoffice-alerts-e-federated
https://swe.ssa.esa.int/metoffice-sep-e-federated
https://swe.ssa.esa.int/metoffice-sw-l1-federated
https://swe.ssa.esa.int/sarif-federated
https://swe.ssa.esa.int/web/guest/atmden-federated

### Products

| Code | Name |
|---|---|
| H.101a | Near-Earth solar wind forecasts (Enlil Ensemble) |
| H.101c | Solar Wind Near-Earth Forecasts (Enlil Ensemble) |
| H.102a | Near-Earth NRT solar wind |
| H.103a | Near-Earth CME arrival time predictions (Enlil Ensemble) |

| Code | Name |
|---|---|
| H.105a | Near-Earth NRT energetic particles |
| H.106a | Near-Earth space weather notifications |
| H.107a_Mars | Heliospheric solar wind forecasts for Mars based on 3D-MHD modelling using Enlil |
| H.107a_Mercury | Heliospheric solar wind forecasts for Mercury based on 3D-MHD modelling using Enlil |
| H.107a_Venus | Heliospheric solar wind forecasts for Venus based on 3D-MHD modelling using Enlil |
| H.108a_Mars | CME Tailored Heliospheric arrival predictions |
| H.108a_Mercury | CME Tailored Heliospheric arrival predictions |
| H.108a_Venus | CME Tailored Heliospheric arrival predictions |
| H.110a_Mars | Tailored Heliospheric Space Weather Alerts |
| H.110a_Mercury | Tailored Heliospheric Space Weather Alerts |
| H.110a_Venus | Tailored Heliospheric Space Weather Alerts |
| I.132 | Atmospheric Density Estimates of Forecast and Prior Total Density for Atmopsheric Drag Calculation |
| R.142 | SaRIF Risk Indicator Panel |
| R.143 | SaRIF GOES-16 Internal Charging Current |
| R.144 | SaRIF GOES-16 Total Ionising Dose and Dose Rate |
| R.145 | SaRIF GOES-16 Radiation Environment |
| R.146 | SaRIF GOES-14 Internal Charging Current |
| R.147 | SaRIF GOES-14 Total Ionising Dose and Dose Rate |
| R.148 | SaRIF GOES-14 Radiation Environment |
| R.149 | SaRIF GIOVE-A Internal Charging Current |
| R.150 | SaRIF GIOVE-A Total Ionising Dose and Dose Rate |
| R.151 | SaRIF GIOVE-A Radiation Environment |
| R.152 | SaRIF Slot Region Internal Charging Current |
| R.153 | SaRIF Slot Region Total Ionising Dose and Dose Rate |
| R.154 | SaRIF Slot Region Radiation Environment |
| R.155 | MOSWOC high energy electron forecast for geostationary orbit |
| R.156 | MOSWOC Forecaster Summary |

| Code | Name |
|---|---|
| R.157 | SaRIF Best Reconstruction of the Radiation Environment |
| S.109c | UKMO Solar flare forecast |
| S.123c | UKMO Solar active region analysis |

## Universidad de Alcalá (UAH)

### Homepage

https://www.uah.es/en/

### Affiliation

Pza. San Diego, s/n
828801 - Alcalá de Henares
Spain

### Contribution to the ESA SWE network

Geomagnetic conditions (13)

### Portal Entry Point

https://swe.ssa.esa.int/uah-ild-map-federated
https://swe.ssa.esa.int/uah-lcis-federated
https://swe.ssa.esa.int/uah-ldis-federated
https://swe.ssa.esa.int/uah-mid-federated
https://swe.ssa.esa.int/uah-sym-h-for-federated
https://swe.ssa.esa.int/web/guest/uah-senmes-federated

### Products

| Code | Name |
|---|---|
| G.126 | Local Disturbance index for Spain |
| G.127 | Local Current index for Spain |
| G.128 | Geomagnetic Storm Occurrence |
| G.129 | Geomagnetic Storm Recovery Phase |
| G.130 | Geomagnetic Storm Subscription |
| G.131 | Geomagnetic Conditions Scale |
| G.132 | GIC Conditions Scale |
| G.133 | Conditions Reports |

| Code | Name |
|---|---|
| G.172 | Local Disturbance indices for the Iberian Peninsula |
| G.173 | Local Current indices for the Iberian Peninsula |
| G.174 | Iberian Local Disturbance Map |
| G.175 | Mid Latitude indices: Ring current (MID-R) and Electrojet (MID-E) |
| G.176 | Forecast of SYM-H and ASY-H indices |

## University of Bergen (UiB)

### Homepage

https://www4.uib.no/en/research/research-groups/space-physics

### Affiliation

Allégaten 55, 5007
Bergen
Norway

### Contribution to the ESA SWE network

Geomagnetic conditions (8)

### Portal Entry Point

### Products

| Code | Name |
|---|---|
| G.177 | BIGG model geomagnetic perturbations |
| G.178 | BIGG model rate of change of the horizontal geomagnetic field |
| G.179 | BIGG model Kp |
| G.180 | BIGG model SYM-H Index |
| G.181 | BIGG model auroral electrojet indices |
| G.182 | BIGG model subsolar magnetopause standoff distance |
| G.183 | BIGG model magnetosphere overview |
| G.184 | BIGG model integrated joule heating |

## University of Oslo (UiO)

### Homepage

https://www.mn.uio.no/fysikk/english/index.html

### Affiliation

Sem Sælands vei 24
0371 Oslo
Norway

### Contribution to the ESA SWE network

Ionospheric weather (4)

### Portal Entry Point

### Products

| Code | Name |
|---|---|
| I.163 | ROTI nowcast for the Arctic region |
| I.164 | ROTI forecast for the Arctic region |
| I.165 | Ionospheric scintillation activity nowcast for the Arctic region |
| I.166 | Ionospheric scintillation activity forecast for the Arctic region |

## UPC-IonSAT (IonSAT)

### Homepage

https://futur.upc.edu/IonSAT

### Affiliation

Campus Nord, Calle Jordi Girona
08034 Barcelona
Spain

### Contribution to the ESA SWE network

Ionospheric weather (6)

### Portal Entry Point

https://swe.ssa.esa.int/web/guest/upc-federated

### Products

| Code | Name |
|---|---|
| I.123a | SISTED (Sunlit Ionosphere Sudden TEC Enhancement) |
| I.123b | SOLERA-drift |
| I.123c | SOLERA (SOLar Euv flux RAte GNSS proxy) |
| I.123d | SISTED warning |
| I.123e | SOLERA-drift warning |
| I.162 | UQRG-GIM - rapid 15-minute resolution global VTEC maps |

## Part 3: Facilities supporting the network

| | S-ESC | H-ESC | R-ESC | I-ESC | G-ESC |
|---|---|---|---|---|---|
| SWE Data Centre (ESOC/SWE Portal) | | | 2 | 11 | |

Facilities Details

SWE Data Centre (SWE Portal)

### Homepage

https://swe.ssa.esa.int/

### Affiliation

Robert-Bosch-Straße 5
64293 Darmstadt
Germany

### Contribution to the ESA SWE network

Space radiation (2)
Ionospheric weather (11)

### Portal Entry Point

https://sraso.swe.ssa.esa.int/
https://swe.ssa.esa.int/ionmon/
https://swe.ssa.esa.int/ism
https://swe.ssa.esa.int/web/guest/sedat1

## Products

| Code | Name |
|---|---|
| I.121 | IONMON TEC maps |
| I.122c | S4 nowcast modelled maps |
| I.122d | SigmaPhi nowcast modelled maps |
| I.122e | TEC nowcast modelled maps |
| I.122f | S4 6-hour forecast modelled maps |
| I.122g | SigmaPhi 6-hour forecast modelled maps |
| I.122i | S4 nowcast modelled values at a given location |
| I.122j | SigmaPhi nowcast modelled values at a given location |
| I.122k | TEC nowcast modelled values at a given location |
| I.122l | S4 6h forecast modelled values at a given location |
| I.122m | SigmaPhi 6h forecast modelled values at a given location |
| R.104 | Space Environment Data System (SEDAT) |
| R.201 | Space Radiation Application for Spacecraft Operators (SRASO) |