DOCUMENT

SSA P2-SWE-XI - SWE Portal System Software User Manual (excerpt[1])

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[1] This document is an excerpt from the original SUM, adapted for the end users of the SWE portal

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CHANGE LOG

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CHANGE RECORD

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Implemented SPR #34	23/01/2018	31	4.5.2.5
Implemented SPR #41	23/01/2018	32	4.5.2.6.1
Added mobile aspects section (SPRs #87, #89)	23/01/2018	62	4.5.3

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1 INTRODUCTION

1.1 Purpose

The SWE Portal provides an interactive Web user interface that links applications available in the SWE Data Centre with data sources available from various providers and incorporates a level of analysis capability.

The Portal is the centralized access point that allows users to access data from the SWE Data and Metadata Repository, allows them to customise their user area and perform data analysis on data and service products. Section 4 lists the set of features provided by the SWE Portal and its underlying services.

The SWE Portal is coherent with the development of the DC-II SWE Portal. It provides similar Web content with links to Federated Services and EOA Portals.

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2 APPLICABLE AND REFERENCE DOCUMENTS

2.1 Applicable Documents

The following documents are applicable. The version and date information of these applicable documents can be found in [RD.1].

Ref.	Title	Code
[AD.1]	Statement of Work: P2-SWE-XI Development of the SWE Ground Segment, Space Situational Awareness Programme, Period 2	SSA-SWE-SYS-SOW-0009
[AD.2]	ECSS-E-ST-40C Space Engineering – Software: Tailoring Type 2, QMS-EIMO-GUID-CKL-9500-OPS	QMS-EIMO-GUID-CKL-9500-OPS
[AD.3]	ECSS-Q-ST-80C Space Product Assurance - Software Product Assurance: Tailoring for Ground Segment Systems	QMS-EIMO-GUID-CKL-9501-OPS
[AD.4]	ESA Network Security Policy[2]	ESA/ADMIN(99)6
[AD.5]	Implementation of the ESA Network Security Policy	EISD-EPNS-00003
[AD.6]	Implementation of the ESA Network Security Policy for OPSNET[3]	DOPS-COM-POL-34555-OPS-ECT
[AD.7]	SSA Preparatory Programme Information and Communication Technologies Design Solution[4]	---
[AD.8]	SSA Systems Specification Document (Option 5)[5]	---
[AD.9]	SSA Precursor Services Software Development Baseline Specification	SSA-DC-SW-SRB-0001
[AD.10]	ESA Security Directives	ESA/ADMIN/IPOL(2008)6, ANNEX 2
[AD.11]	Virtual Machine Provisioning Request Form	VM provisioning request
[AD.12]	ESA Security Plan Template[6]	---
[AD.13]	SSA Software Configuration Management[7]	SSA-CS-SW-CMP-001
[AD.14]	Monthly Progress Report Template EGOS-GEN-BIRFSW-TN-1002-I3R4+MPRtool.xls	BIRF-MPR
[AD.15]	Tasking Centre Systems[8]	SSA-TC-ENV-SP-0001
[AD.16]	IRE Systems[9]	SSA-IRE-ENV-SP-0001
[AD.17]	Space Weather Systems[10]	SSA-SWE-ENV-SP-0001
[AD.18]	Email Service Interface Control Document	SSA-CS-GEN-ICD-0008
[AD.19]	File Service and File Listener Interface Control Document	SSA-CS-GEN-ICD-0002
[AD.20]	Log Service and Log Listener Interface Control Document	SSA-CS-GEN-ICD-0009
[AD.21]	Notification Service Interface Control Document	SSA-CS-GEN-ICD-0004
[AD.22]	Email Service Software Design Document	SSA-CS-GEN-SDD-0008

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[2] This document is now obsolete or no longer applicable.

[3] This document is now obsolete or no longer applicable.

[4] This document is now obsolete or no longer applicable.

[5] This document is now obsolete or no longer applicable.

[6] This document is now obsolete or no longer applicable. The Traffic Matrix shall be provided as part of the SCF.

[7] This document is now obsolete. It will be replaced by [AD.53].

[8] This document is now obsolete. The corresponding information will be provided by ESA in another form.

[9] This document is now obsolete. The corresponding information will be provided by ESA in another form.

[10] This document is now obsolete. The corresponding information will be provided by ESA in another form.

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Ref.	Title	Code
[AD.23]	File Service and File Listener Software Design Document	SSA-CS-GEN-SDD-0002
[AD.24]	Log Service and Log Listener Software Design Document	SSA-CS-GEN-SDD-0009
[AD.25]	Notification Service Software Design Document	SSA-CS-GEN-SDD-0004
[AD.26]	Email Service and Email Listener Software User Manual	SSA-CS-GEN-SUM-0008
[AD.27]	File Service and File Listener Software User Manual	SSA-CS-GEN-SUM-0002
[AD.28]	Log Service and Log Listener Software User Manual	SSA-CS-GEN-SUM-0009
[AD.29]	Notification Service Software User Manual	SSA-CS-GEN-SUM-0004
[AD.30]	Deployment Architecture Technical Note	SSA-CS-GEN-TN-0003
[AD.31]	SSA DC-II SWE Portal Services – Interface Control Document	SSA-SWE-SWEP-ICD-0001
[AD.32]	SSA DC-II SWE Portal Services – Software Design Document	SSA-SWE-SWEP-SDD-0001
[AD.33]	SSA DC-II SWE Portal Services – Software User Manual	SSA-SWE-SWEP-SUM-0001
[AD.34]	SWE Data Service User Manual	SSA-SWE-SWEP-SUM-0002
[AD.35]	SWE Import Service User Manual	SSA-SWE-SWEP-SUM-0003
[AD.36]	SWE Data Subscription Service User Manual	SSA-SWE-SWEP-SUM-0004
[AD.37]	SWE Alert Service User Manual	SSA-SWE-SWEP-SUM-0005
[AD.38]	SWE Alert Subscription Service User Manual	SSA-SWE-SWEP-SUM-0006
[AD.39]	SWE Metadata Service User Manual	SSA-SWE-SWEP-SUM-0007
[AD.40]	SWE Metrics Service User Manual	SSA-SWE-SWEP-SUM-0008
[AD.41]	SWE Dataset Downloader BP Service User Manual	SSA-SWE-SWEP-SUM-0009
[AD.42]	SWE Data Import BP Service User Manual	SSA-SWE-SWEP-SUM-0010
[AD.43]	SWE Data Subscription BP Service User Manual	SSA-SWE-SWEP-SUM-0012
[AD.44]	SWE Alert Subscription BP Service User Manual	SSA-SWE-SWEP-SUM-0013
[AD.45]	SWE Metrics Generation BP Service User Manual	SSA-SWE-SWEP-SUM-0015
[AD.46]	SWE User Utility Service User Manual	SSA-SWE-SWEP-SUM-0016
[AD.47]	SWE User Data Access BP Service User Manual	SSA-SWE-SWEP-SUM-0017
[AD.48]	SWE User Data Analysis BP Service User Manual	SSA-SWE-SWEP-SUM-0018
[AD.49]	SWE User Subscriptions BP Service User Manual	SSA-SWE-SWEP-SUM-0019
[AD.50]	DC-IV WP-SWE CDR Updated Datapack[11]	SSA-SWE-DCIV_PostCDR
[AD.51]	SSA Open AM Environment	SSA-CS-PRO-0001
[AD.52]	SSA Software Application Test & Validation Concept	SSA-CS-SW-TN-0002
[AD.53]	SSA Configuration Control Procedures	TBD
[AD.54]	SSA SWE – Two New Precursor Services – RAF – Software Requirement Specification	SSA-SWE-RAF-SRS-0002
[AD.55]	SSA SWE – Two New Precursor Services – ISM – Software Requirement Specification	SSA-SWE-ISM-SRS-0002
[AD.56]	SSA SWE – Two New Precursor Services – SWE Services – Software Design Document	SSA-SWE-SWEP-SDD-0040
[AD.57]	SSA SWE – Two New Precursor Services – SWE Portal System – Software Design Document	SSA-SWE-SWEP-SDD-0200

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[11] This datapack is now obsolete and is replaced by the DC-IV SWE 1.1.2 datapack provided as a CFI. See [AD.54] - [AD.59].

Ref.	Title	Code
[AD.58]	SSA SWE – Two New Precursor Services – SWE Services – Interface Control Document	SSA-SWE-SWEP-ICD-0040
[AD.59]	SSA SWE – Two New Precursor Services – SWE Portal System – Interface Control Document	SSA-SWE-SWEP-ICD-0200

Table 1: Applicable Documents

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2.2 Reference Documents

The following list of reference documents is for general guidance only and need not to be applied, but they should be given precedence over other documents covering similar topics. The version and date information of these reference documents can be found in [RD.1].

Ref.	Title	Code
[RD.1]	SSA P2-SWE-XI SWE Portal System - Glossary	SSA-SWE-SWEP-GLO-0003
[RD.2]	SSA P2-SWE-XI - SWE Portal System - Software Configuration File	SSA-SWE-SWEP-SCF-0001
[RD.3]	SSA P2-SWE-XI - SWE Portal System - Software Design Document	SSA-SWE-SWEP-SDD-0001
[RD.4]	SSA P2-SWE-XI - SWE Portal System - Interface Control Document	SSA-SWE-SWEP-ICD-0001
[RD.5]	SSA P2-SWE-XI - SWE Portal System - Software Release Document	SSA-SWE-SWEP-SRelD-0005
[RD.6]	Liferay Portal Administration Guide http://docs.liferay.com/portal/6.0/official/liferay-administrator-guide-6.0.pdf	---
[RD.7]	SOA Principles of Service Design by Thomas Erl http://serviceorientation.com/index.php/whatissoa/P27	ISBN: 0132344823
[RD.8]	SSA SWE - Two New Precursor Services - Software User Manual for Users	SSA-SWE-SWEP-SUM-0100

Table 2: Reference Documents

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3 TERMS, DEFINITIONS AND ABBREVIATED TERMS

3.1 Acronyms

Acronyms used in this document and needing a definition can be found in [RD.1].

3.2 Glossary

A glossary of the terms and definitions used in this document can be found in [RD.1].

In this document, the technical term "offering" used in other documents has been replaced by the term "time series" which is more appropriate for the End User. Both terms are equivalent.

The term "time series" being scientifically debatable, the term is used as a synonym of "dataset" in the context of this document.

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4 OPERATIONAL MANUAL

4.1 General

The new SWE Portal is a major technological evolution of the precursor SSA DC-II SWE Portal and is a result of the outcome of the SSA P2-SWE-XI activity. The focus of this document is mainly on the new SWE Data Browser Application.

The SWE Portal System is normally operated through its SWE Portal. The underlying services are not exposed to the end user and are, therefore, not covered in this document.

The SWE Data Browser Application is a Web application available through a standard Web browser.

The application should be accessible as long as the Security means (firewall, etc.) between the user and the Web portal allow the (HTTPS) communication.

4.2 Set-up and Initialisation

The following SWE Portal set-up procedures are described in the Software Configuration File document [RD.2]:

- Software build

- Software installation

- Software configuration

4.3 Getting Started

The portal can be accessed at https://swe.ssa.esa.int/ using one of the following Web browsers:

- Internet Explorer version 9 or higher

- Firefox version 47 or higher

- Chrome version 50 or higher[12]

The first page displayed when accessing the SWE Portal is the Current Space Weather page as shown below.

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[12] Note that the SWE Portal cannot be used with the most recent versions of the Google Chrome browser (as of writing: >83) due to the breaking of the federation mechanism we currently use for the SWE Portal (enforcing the setting of specific cookie attributes and refusing to set cookies which do not meet those criteria).

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Figure 1: SWE Portal Home Page

4.4 Mode Selection and Control

In order to access protected resources on the SWE Portal (e.g. the SWE Data Browser Application and the "Service Preferences" within the section 'Space Weather at ESA' in the left panel), the user must be registered on the SSA SSO Identity Provider.

The user may request its registration as explained below in section 4.5.1.2.

4.5 Normal Operations

This section first focuses on general user operations, then lists the operations related to the SWE Data Browser Application, and finally describes administration operations.

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4.5.1   SWE Portal Operations

4.5.1.1 Pages View

A set of HTML pages (some being portal links and some being external pages) are accessible through a site navigation menu located on the left section of every pages. Clicking on the HTML links leads to pages related to Space Weather information, user domains pages, expert service centres, applications, documents, helpdesk or also events.

Note that every pages mentioned in the later sections are accessible through the left-side navigation menu.

4.5.1.2 User Registration

The user may request the creation of a user account on the SWE Portal by filling out the registration form. The registration form can be reached via "Request for Registration" from the left-hand menu. This form consists of two pages.
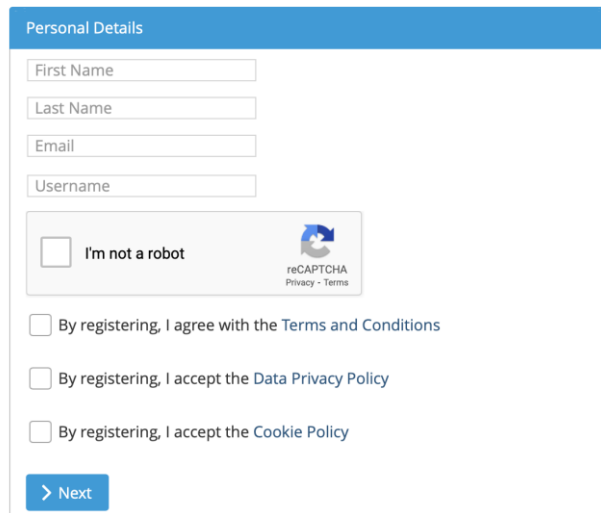
Figure 2: Registration Form First Page

The first page requires the input of basic information such as name, email address and the user name. The username needs to start with a lower-case letter and may only contain alphanumeric characters.

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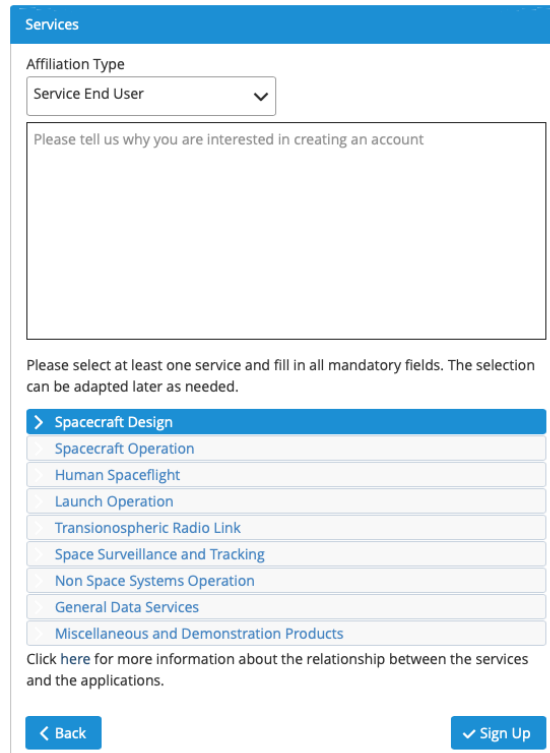
Figure 3: Registration Form Second Page

The second page of the registration form asks for the user's affiliation and preference for services offered by the SWE Portal. After clicking on the button "Sign Up" an email with a confirmation link will be sent to the registered email address. This link will open a page that allows selecting a password and finalising the registration.

In case the password needs to be restored, the "Forgot Password" functionality can be used. After entering the email address associated to a user profile, a confirmation link is sent to this address. This link opens a page that allows choosing a new password.
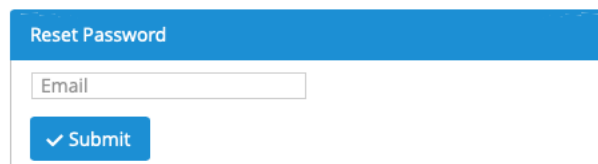
Figure 4: Forgot Password Form

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4.5.1.3 Service Selection

During the registration process the user selected the services they are most interested in. This service selection can be changed at any time via the service selection portlet. Next to each service is a tick box which allows users stating their interest to subscribe to a particular service.

ID	Name	Description	Group	Subscribed
SCD/arv	Environment specification: data archive	Environment specification: data archive	Spacecraft Design	☑
SCD/orb	Environment specification: in orbit verification	Environment specification: in orbit verification	Spacecraft Operation	☑
SCD/pst	Post event analysis	Post event analysis	Human Spaceflight	☑
SCD/pla	Space Weather in the Solar System	Space Weather in the Solar System	Launch Operation	☐
SCO/orb	In-orbit environment and effects monitoring	In-orbit environment and effects monitoring	Transionospheric Radio Link	☑
SCO/pst	Post-event analysis	Post-event analysis	Space Surveillance and Tracking	☑
SCO/for	In-orbit environment and effects forecast	In-orbit environment and effects forecast	Non Space Systems Operation	☑
SCO/ana	Mission risk analysis	Mission risk analysis	General Data Services	☑
SCO/pla	Space Weather in the Solar System	Space Weather in the Solar System	Miscellaneous and Demonstration Products	☑

✔ Update Services

Figure 5: Service Selection Portlet

4.5.1.4 User Login

From any page of the portal, the user clicks on the "Sign In" link (in the bottom left corner). The user is then redirected to the Authentication Service (SSA SSO Identity Provider) login page.

The user enters the User Name and its personal Password, and then clicks on the Log In button.

Figure 6: Login Page

If the login is successful, the source page (before proceeding to the login) is displayed again with the user name displayed instead of the "Sign In" link.

In case the login fails, the message "Login/password combination is invalid" is displayed and the user may retry to log in.
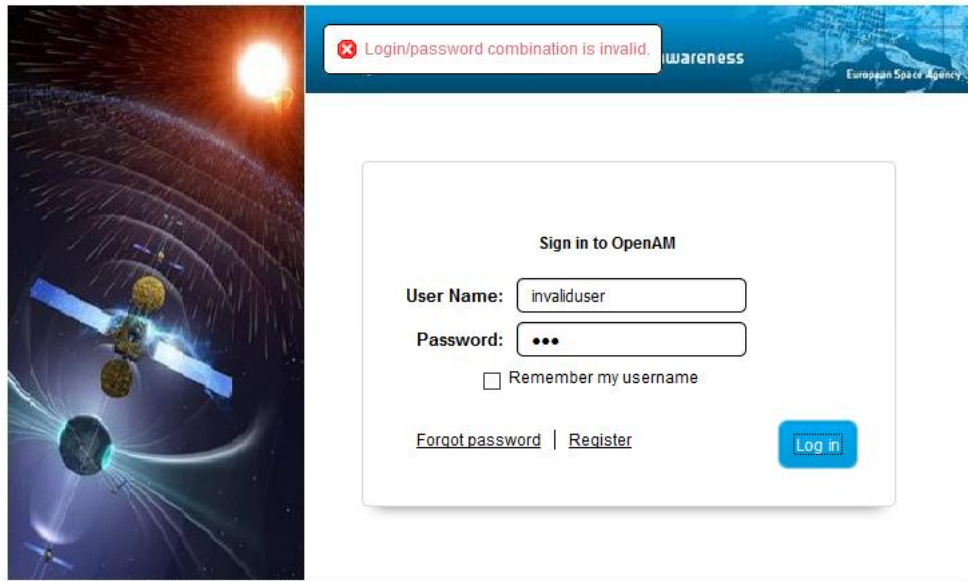
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Figure 7: Login Failed Page

In case the password is forgotten, the user can click on the link 'Forgot password' and follow the description of section 4.5.1.2.

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4.5.1.5 Home Page

The home page includes a set of information blocks, called tiles. The home page content depends on the customisation performed by the administrator as described in the dedicated section 4.5.3.

Figure 8: Home Page

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4.5.1.6 Personal Dashboard

The personal dashboard[13] is a customisable page only available when the user is signed in. This page aims to display the Web content of interest for each user. By display, a welcome message portlet provides a short description of the page purpose.

4.5.1.7 Start SWE Data Browser Application

Once the user is logged in, the SWE Data Browser Application is then accessible by clicking on any Expert Service Centres, then choose "SWE Data" link in "Tools and Products" section.

The following page is displayed:
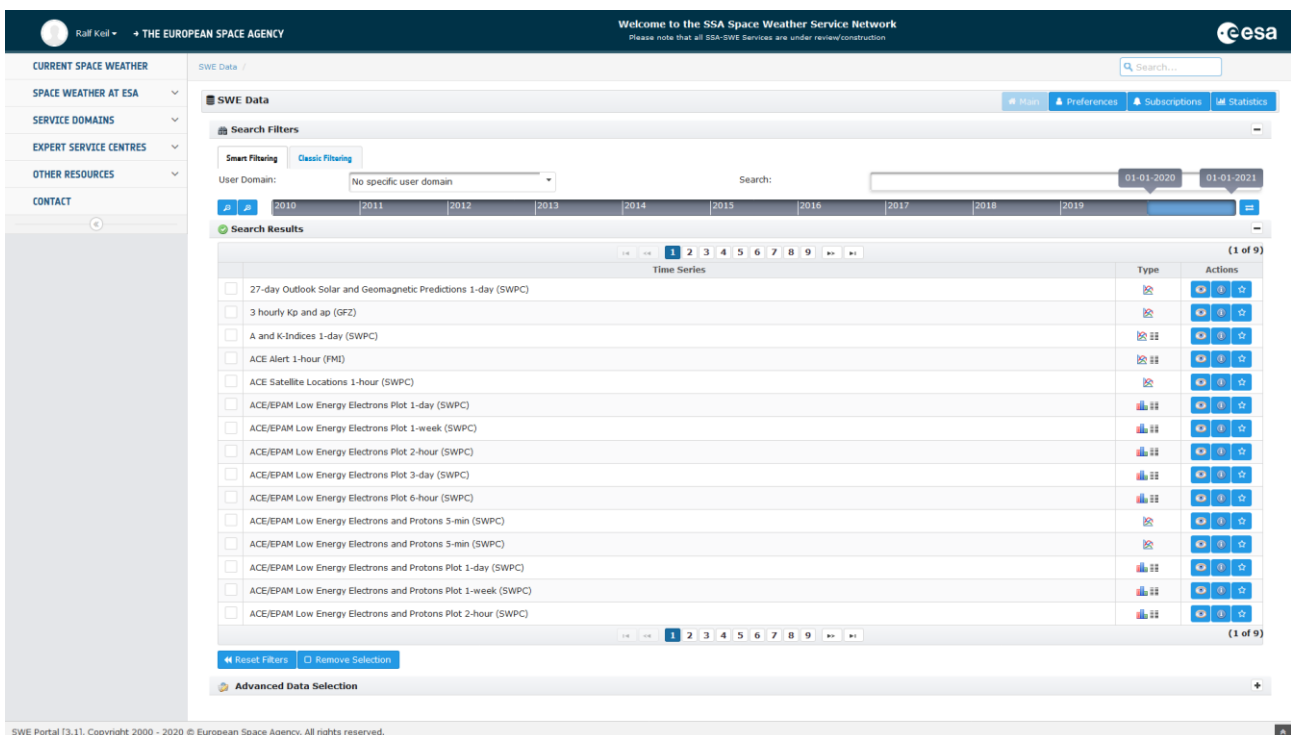
Figure 9: SWE Data Browser Application Page

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[13] This functionality is not yet available to the end users. It is envisaged to be implemented in the next SWE Portal release.

4.5.2 SWE Data Browser Application Operations

The SWE Data Browser Application consists of a main user interface view used to search and visualize time series data, and three secondary interface views used to manage and configure additional aspects:

- User preferences: allows the user to customise the SWE Data Browser Application regarding his/her preferences.

- Subscriptions: allows the user to manage, modify, and delete his/her own data or alert subscriptions.

- Statistics: give statistics information about the SWE Data Providers.

The main interface view also allows displaying viewer windows that are used to visualize data records of time series.

This section describes the operations related to the SWE Data Browser Application.

Note: the following sections detail all operations and describe all interface components including those which may be disabled in the portlet configuration or in the user preferences.

4.5.2.1 Application Layout

The multiple interface views are accessible from the links present in the top menu of the SWE Data Browser Application (see figure below).

The main user interface of the SWE Data Browser Application is composed of three main panels:

- Search Filters panel: it helps the user to find specific and relevant data in a wide collection of Time Series.

- Search Results panel: it is a list of matching Time Series (a set of observation data) following the user filters query.

- Advanced Data Selection panel: it is expanded when the user wants to group multiple data sources into a single request or when only a subset of fields must be selected.
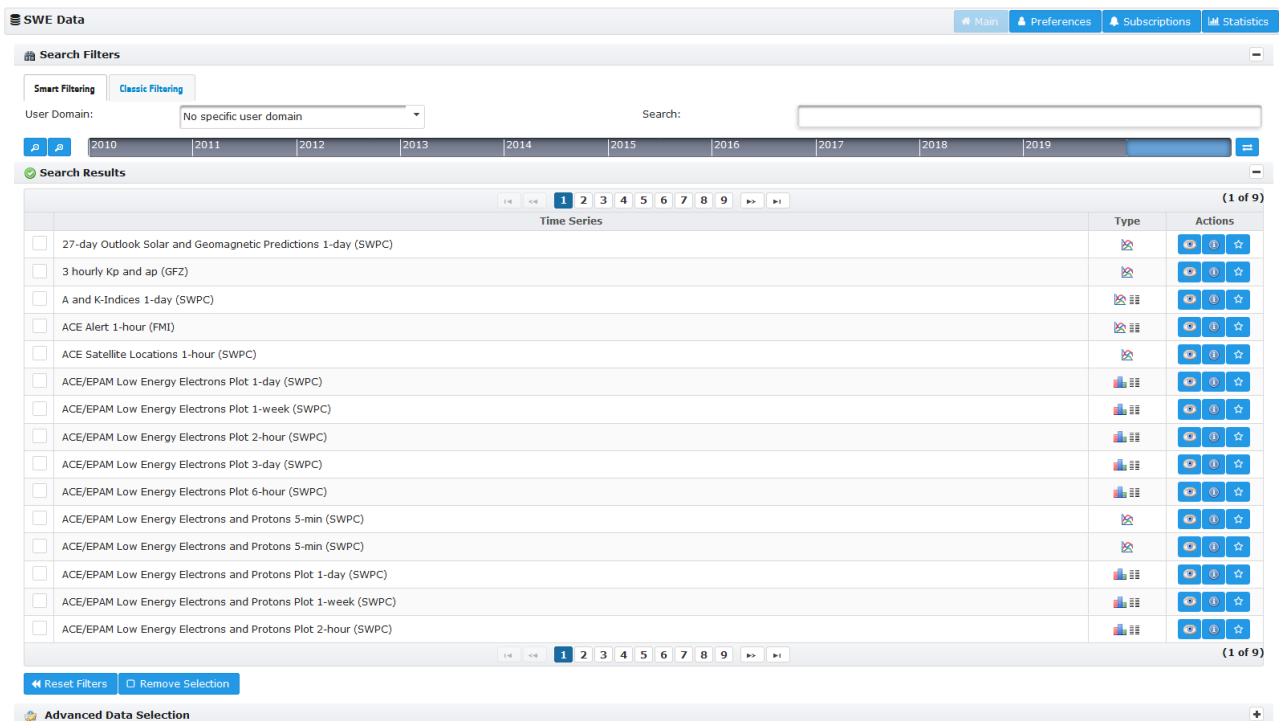
Figure 10: SWE Data Browser Application Home

4.5.2.2 Search for Time Series

The user may search for data of interest by filtering the Time Series using the Search Filters panel. Setting a filter reduces the list of datasets: only Time Series matching the selected filters are displayed.

A classical filtering mode is available with any device. Using a desktop or laptop device, an advanced filtering (called smart filtering) allows to quickly define a query, as described in further sections.

4.5.2.2.1   Select a User Domain

The order of time series displayed in the results area depends on the user domain selected. The selection of user domain is available in both smart and classic filtering.

The user preferred domain is initially selected (see the user preferences operation in this document). The user may choose a different user domain by clicking on the widget and selecting a new available value.

The user may select to get all Time Series by clicking "No specific user domain" (the default option), or to select one of the user domains (defined in Appendix A of [RD.3]), or the "Personalised Domain".

4.5.2.2.2   Select a Time Range

The Time Range filters on Time Series which include at least one data record within the range. This feature is used to quickly find time series having records in a specific time range.

A time range slider is displayed by default, but the user may switch the widget to classical date pickers as described below.

4.5.2.2.2.1   Switch between Time Range Slider and Picker

The user may switch between the two proposed widgets by clicking on the switch button illustrated below.
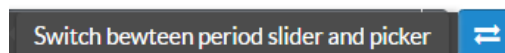
Figure 11: Switch between range slider and picker

4.5.2.2.2.2   Select a Time Range using the Slider

The slider can be moved to modify the filtering period (duration). The user clicks on the indicator and drags it to the desired time range.

If a mouse device is used, the user may also modify the range bounds by dragging the left side or right side of the indicator.
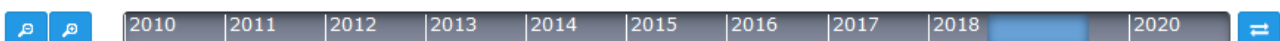
Figure 12: Time Range Filter Slider

On the left, the buttons allow to increase or decrease the slider range by a factor of 2. Note carefully that modifying the slider range only modify the bounds of this slider, but has no effect on the selected time period.
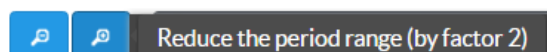
Figure 13: Slider Range Zoom Buttons

As shown on the figure below, when increasing the slider range (left zoom out button), the slider range starts now from year 2000.
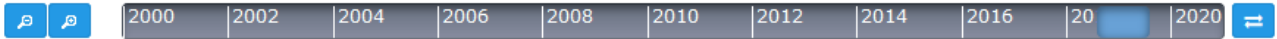
Figure 14: Increased Range on Timer Range Filter Slider

4.5.2.2.2.3   Select a Time Range using the Pickers

The date pickers allow the user to modify the range start date or end date by clicking on the calendar button and selecting a new date.
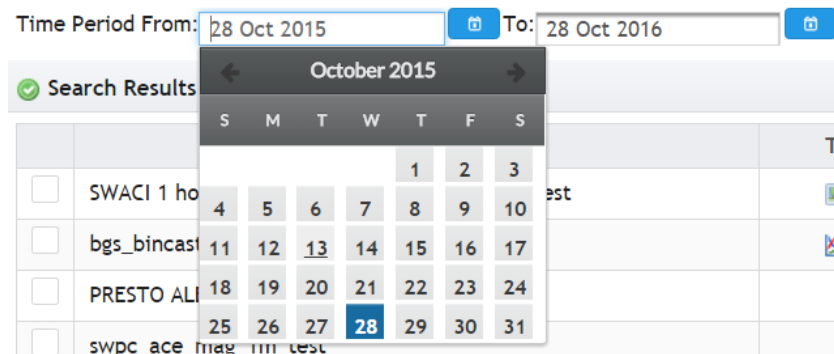
Figure 15: Timer Range Filter Pickers

4.5.2.2.3   *Search for Time Series using Smart Filtering*

The smart filter allows the user to start typing keywords. The auto-completion feature displays suggested keywords. The user may select a proposed suggestion as soon it appears in the suggestion list.

As illustrated on the figure below, the user starts typing "space". And some keyword suggestions are proposed. The user may click on any of the propositions.
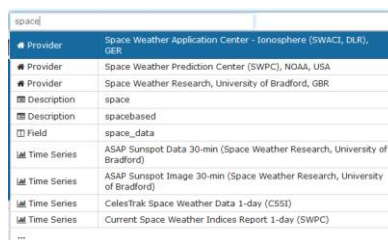
Figure 16: Smart Filter – Suggestions

The suggestions are classified depending in which metadata field the keyword is present.

As illustrated on the figure below, the user starts writing «electron». The user may choose to filter for datasets that have a field data type « Electrons » (or « ElectronFlux »), or the user may choose to filter for datasets which includes the keyword « electron » in the description metadata.
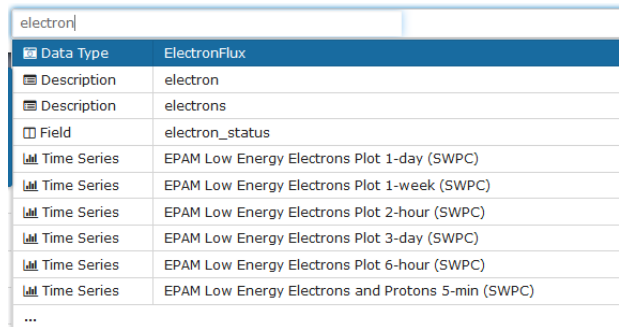
Figure 17: Smart Filter - Different Suggestion Categories

Note that, a tooltip on the left helps the user to understand the corresponding action, as illustrated on the figure below.
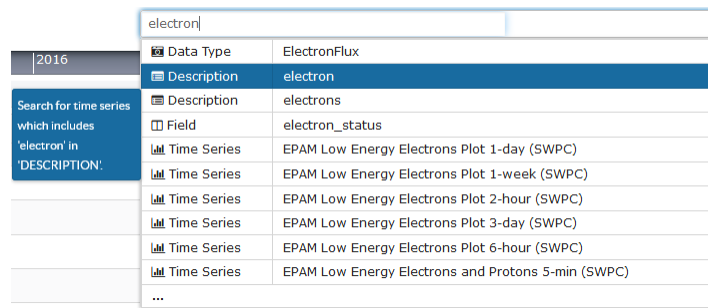
Figure 18: Smart Filter - Tooltip for Suggestions

Smart filters can hold a list of several terms (restricting conjunctively – AND – the data series results). As illustrated below, the user has restricted the search of time series to those including "data" in the description, including a "Protons" field type, and is typing a new keyword in the smart filter widget.
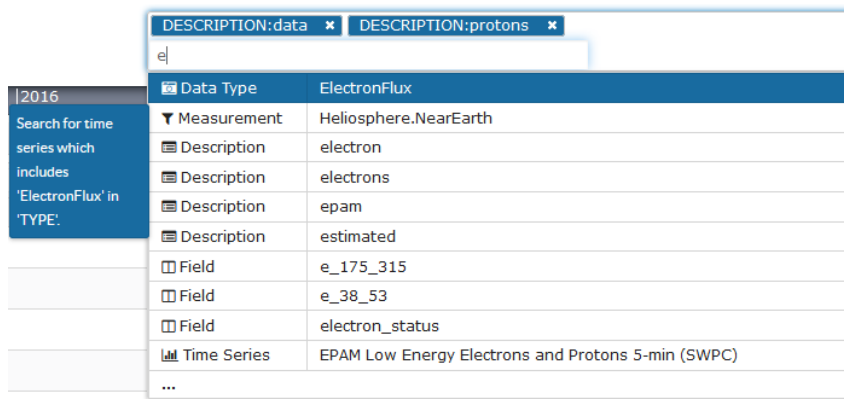
Figure 19: Smart Filter - A Complex Query

The categories available for metadata keywords are dataset name (« NAME »), description (« DESCRIPTION »), field name (« FIELD »), field data type (« TYPE »), measurement (« MEASUREMENT »), time series (« TIMESERIES »), and provider (« PROVIDER »).

4.5.2.2.4   Search for Time Series using Classical Filtering

The Search Data Filters panel includes the following menu selection fields. The user may modify the field value by clicking on the widget and selecting a new available value.

- Measurement Domain: the user may modify the field value by clicking on the widget and selecting a new available value. Note that the "None" value refers to the Time Series which are not linked to any measurement domain.

- Provider: the company providing the data.

- Acquisition: the acquisition type (measured, processed, …). The user may modify the field value by clicking on the widget and selecting a new available value.

- The Observed Properties filter lists the fundamental data types supported by the matching results. The user may add or remove properties by adding or removing properties to the right list using the "add" and "remove" buttons.

Also, the keywords filter searches in metadata (in the Time Series description and in the field descriptions) for the matching Time Series. Keywords shall be separated by blank spaces. The filter matches the Time Series which contain all the entered keywords (not case sensitive).

Note that, when selecting the value of a particular filter, the other filter values are also updated to reflect the possible values of matching datasets. In particular, as illustrated on the figure below, filtering for the particular SWPC data provider reduces the possible acquisition values (i.e. processed acquisition is not available anymore) because no matching dataset includes processed acquisition data.

Figure 20: Data Discovery - Filter Effect

By default, filters are set to "All" which means that the considered filter accept any value of the available Time Series.

4.5.2.3 Select a Dataset

In the Search Results panel, the datasets matching the filters values are listed in the priority order defined by the selected user domain (see previous section).

The number of rows displayed at the same time depends on the application configuration. By default, 10 rows are displayed on desktop devices, 5 only on small devices. The user shall use the paginator widget (which includes different navigation buttons) to browse the results.

Figure 21: Pagination Buttons

The Search Results table includes the following columns:

- Title: a maximum 64 characters title

- Type: indicates the type(s) of available data that may be displayed in the viewer.

- Actions: available command buttons

- Checkbox: on the left of the rows, a checkbox allows to prepare an advanced data selection to perform actions on it (visualise or analyse).

Figure 22: Dataset Discovery - Search Results

Types are represented by graphical icons described below. A tooltip is displayed when the mouse is moved over the icon. The column may be hidden according to the user preferences.

- Textual: ▤

- Numerical values (a chart maybe generated automatically): ▨

- Static plot image: ▥

- Map image: 🌐

- Other kind of images: 🖼

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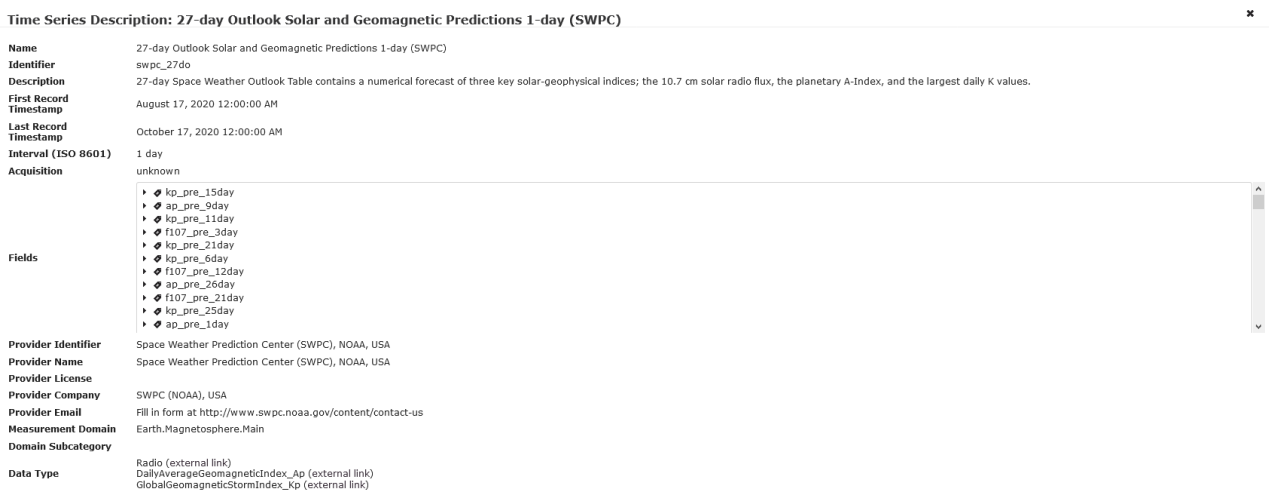
The action buttons are illustrated below. A tooltip is displayed when the mouse is moved over the icon.

- Display data in a viewer:

- Display of Time Series metadata:

- Add to favourites:

4.5.2.4 Show Metadata

When clicking on the "display Time Series metadata" icon (   ), the available metadata information about the Time Series are displayed to the user, as illustrated on the figure below.

Some sections may be expanded (+) or collapsed (-) by clicking on the respective button.

Figure 23: SWE Data Browser - Show Metadata

The window can be closed by clicking on the close button (   ).

4.5.2.5 Add a Dataset to Favourites

When clicking on "Add to favourites" button (   ), the dataset is bookmarked in order to appear on top of any other dataset in the results.

However, a bookmarked dataset does not appear in the results if it does not comply to the search criteria.

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Figure 24: SWE Data Browser – Favourite Dataset

4.5.2.6 Compose an Advanced Data Selection

The Advanced Data Selection is a selection of fields in <u>multiple</u> datasets. For this set of datasets and fields, the user may display a viewer and execute the same operations as for a single dataset (display a table of the records, subscribe for the data, analyse the data, etc.).

The Advanced Data Selection acts in a similar way as a software shopping basket (often shortened on websites to "basket"): it allows users to accumulate a list of items. Of course, the intent is not to purchase the datasets but the functions to manage the selection are similar:

- Add an item

- Remove an item

- Clear the item list

4.5.2.6.1 Add a Dataset to Advanced Data Selection

The user may add a dataset to the advanced data selection by clicking on the checkbox at left of the dataset row ( ) in the Search Results.

When a Time Series row is selected:

- Time Series checkbox is displayed as checked ( ).

- Advanced Data Selection panel is expanded (if collapsed).

- Time Series entry is added in the Advanced Data Selection panel.

The Time Series entry is added in the Advanced Data Selection with no fields selected (see exception further in the section).
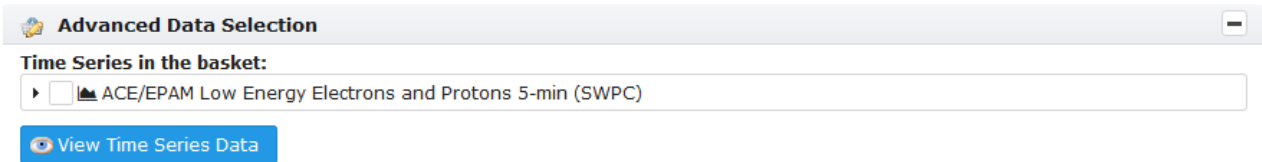
Figure 25: Advanced Data Selection - Added Entry

By clicking on the left arrow, the Time Series entry is expanded. No fields are selected (except for the case described further).

The Advanced Data Selection entry is displayed as a tree. The fields are categorized according to their data types. The fields which are not categorized for a particular data type are grouped in the « Additional Data » branch of the tree.
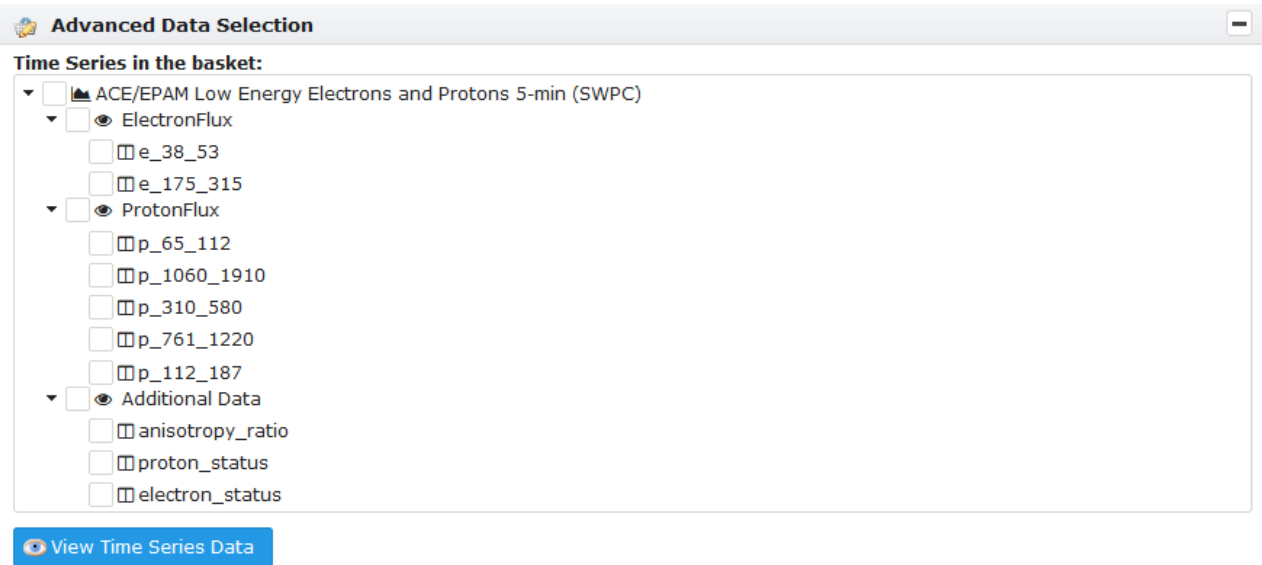
Figure 26: Advanced Data Selection - Expanded Entry

In case the user filtered for a particular data type, then the branch is directly selected when adding the dataset to Advanced Data Selection as shown on figure below.

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Figure 27: Advanced Data Selection - Expanded Entry When Description Filtering

4.5.2.6.2 *Remove a Dataset from the Advanced Data Selection*

The user may remove a dataset from the advanced data selection by clicking on the checkbox at the left of the dataset row (☑) in the Search Results.

When a Time Series row is unselected:

- Time Series checkbox is displayed as unchecked (☐).
- Advanced Data Selection panel is expanded (if collapsed).
- Time Series entry is removed in the Advanced Data Selection panel.

Note that, if the Time Series entry is not shown in the Search Results panel, the user either may reset the selection (see operation in further sections), or the user searches again for this particular dataset (e.g. using the smart filtering).

4.5.2.6.3 *Remove the Advanced Data Selection*

The user may clear the whole set of Time Series entries accumulated in the Advanced Data Selection by clicking on the Remove Selection button.

Figure 28: Advanced Data Selection - Remove Selection Button

4.5.2.6.4 *Select or Unselect All Fields of a Dataset*

The user may select or unselect all fields of a particular basket entry, by clicking on the checkbox next to the dataset tree node.

In case of a selection, all fields will be marked as selected (☑), in case of unselection, all fields will be marked as unselected (☐).
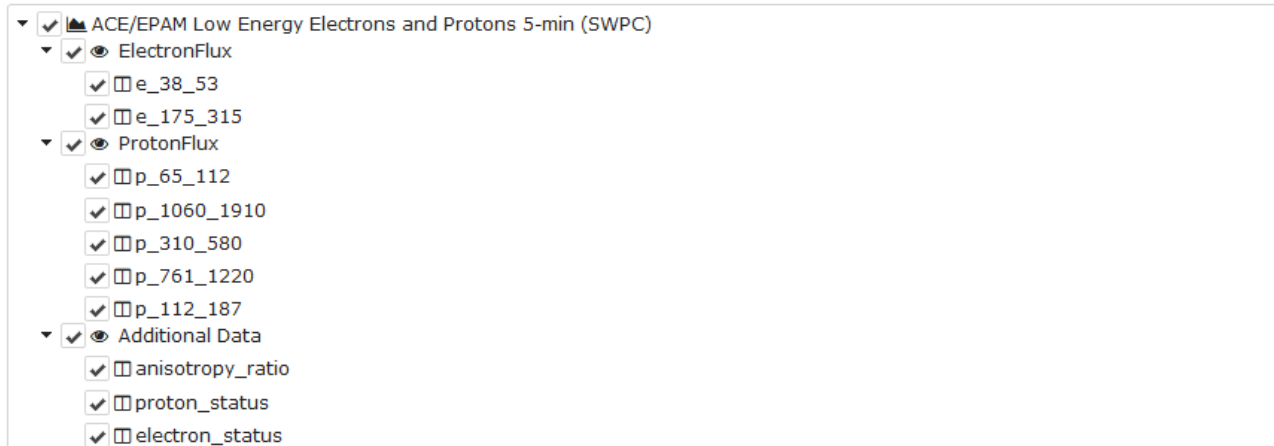
Figure 29: Advanced Data Selection - Selecting All Fields

4.5.2.6.5 *Select a Single Field of a Dataset*

The user may select or unselect a single field of a particular basket entry, by clicking on the checkbox next to the field tree node.

In case of a selection, the field will be marked as selected (☑), in case of unselection, the field will be marked as unselected (☐).

Note that the dataset checkbox, and the data type checkbox, will be marked as selected (☑), unselected (☐) or partially selected (▬), depending of the selected fields.
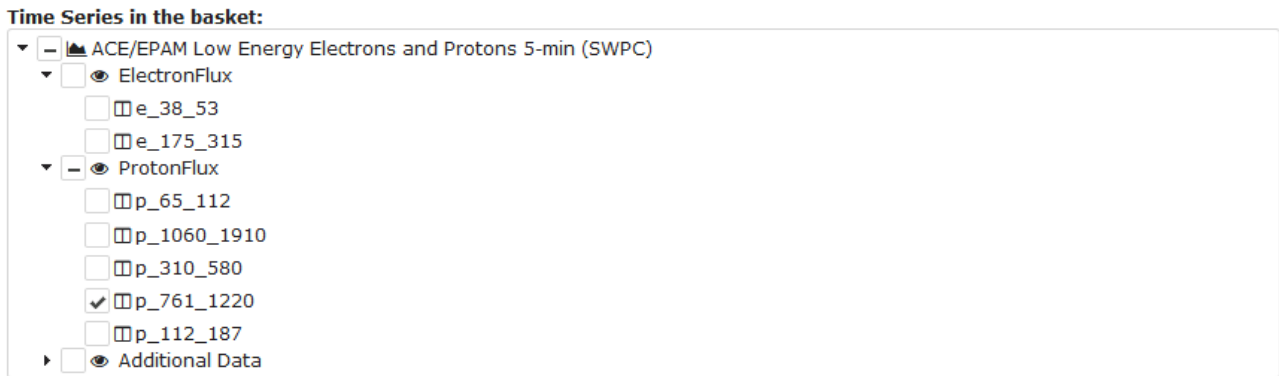
Figure 30: Advanced Data Selection - Selecting Single Field

4.5.2.6.6   *Select a Group of Fields of a Dataset*

The user may select or unselect a data type group of fields of a particular basket entry, by clicking on the checkbox next to the data type group tree node.

In case of a selection, the data type group will be marked as selected (☑) and all fields members. In case of unselection, the data type group will be marked as unselected (☐).

Note that the dataset checkbox will be marked as selected (☑), unselected (☐) or partially selected (⊟), depending of the selected fields.
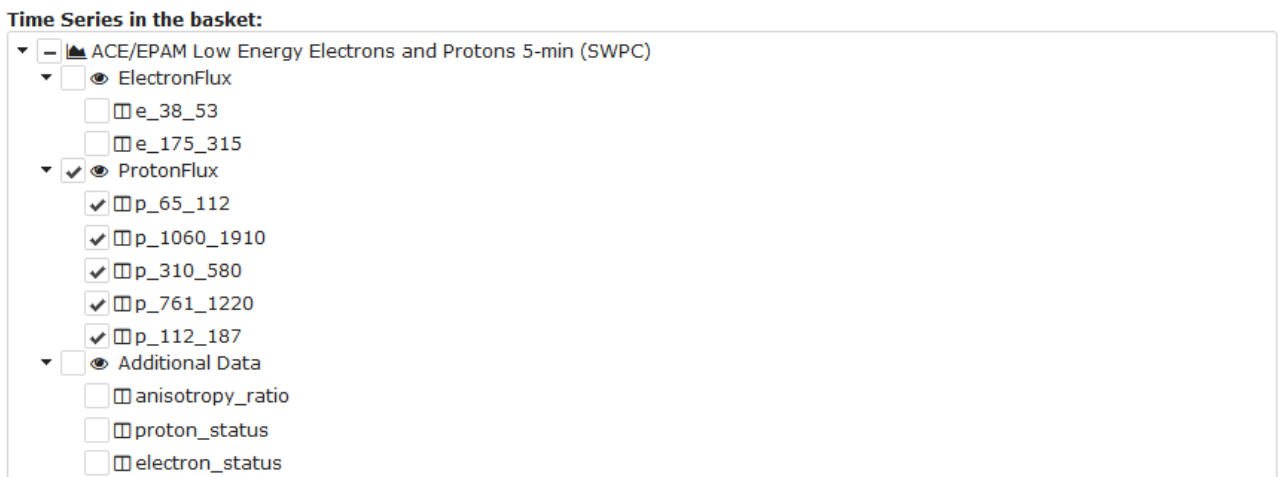
Figure 31: Advanced Data Selection - Selecting Data Type Group

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4.5.2.6.7   Display Viewer of Advanced Data Selection

When the user is satisfied with the collection of datasets and the selected fields, the "View Time Series Data" button triggers the visualisation in the viewer.
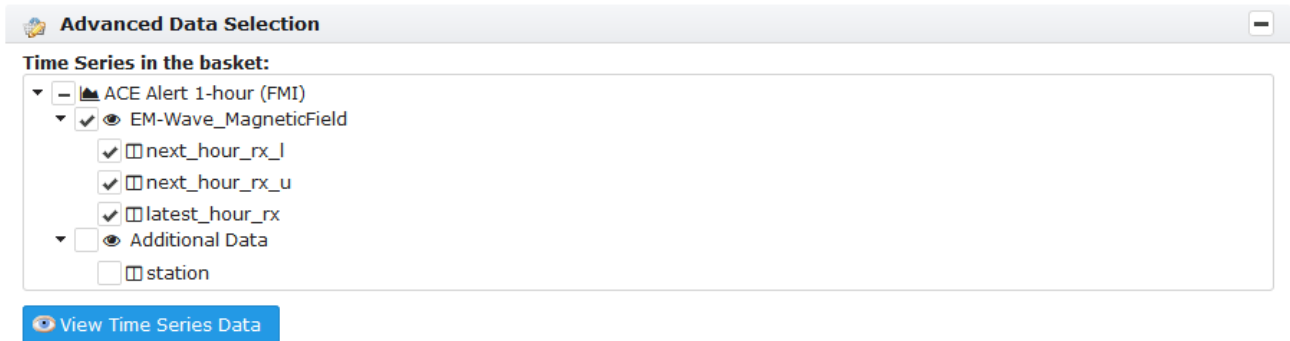
Figure 32: Advanced Data Selection - View Time Series Data Button

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4.5.2.7 Data Viewer Display Operations

4.5.2.7.1   Show Data Viewer

When clicking on the "View Time Series Data" icon (   ), the data viewer is displayed.

The Data Viewer is a floating window used to visualise any data requested by the user. It consists of the following interface elements:

- Header title
- Menu
- Set of available views
- Time range browser

The set of available views is a tabbed document interface that allows switching between the multiple panels (one for each available view). The list of the possible views is displayed:

- "Table View" displays all the fields in a common table (see Figure 33).
- "Chart View" groups all the numeric fields (integer, float, etc.) in a single chart view.
- For any binary field, a dedicated view is also available.

Figure 33: Data Display - Table View

The table view is displayed when opening a viewer.

4.5.2.7.2 Case of Advanced Data Selection

In case of the display of a basket (from the Advanced Data Selection panel), the user may display a merged visualization of the data. The user shall choose between the table view and the chart view.

Basket Viewer

Table View | Chart View

| From: 23.09.2020 18:25 | To: 23.09.2020 19:05 | | | 10 Rows | Columns |

Time	e_38_53 cm^-2 s^-1 sr^-1 MeV^-1	e_175_315 cm^-2 s^-1 sr^-1 MeV^-1	p_115_195 cm^-2 s^-1 sr^-1 MeV^-1	p_47_68 cm^-2 s^-1 sr^-1 MeV^-1	cm^
23.09.2020 18:25	726.0	30.0	20.9	2470.0	0.20
23.09.2020 18:30	742.0	34.4	22.3	2390.0	0.15
23.09.2020 18:35	1120.0	34.9	25.9	2750.0	0.15
23.09.2020 18:40	840.0	31.8	25.3	2710.0	0.20
23.09.2020 18:45	788.0	31.3	24.6	2320.0	0.17
23.09.2020 18:50	1010.0	32.1	22.8	2430.0	0.14
23.09.2020 18:55	750.0	35.3	19.3	2430.0	0.19
23.09.2020 19:00	750.0	34.5	21.3	2460.0	0.23
23.09.2020 19:05	791.0	37.7	20.3	2350.0	0.18

2020 Sep 21 | 2020 Sep 22 | 2020 Sep 23

Figure 34: Data Display - Basket

4.5.2.7.3 Close Data Viewer

The data viewer window can be closed by clicking on the close button (✖).

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4.5.2.7.4 *Minimise Data Viewer*

The user may minimise the data view by clicking on the minimise button in the header (–). The data viewer is then displayed at bottom of the page. Note that the viewer still may be closed when it is minimised.
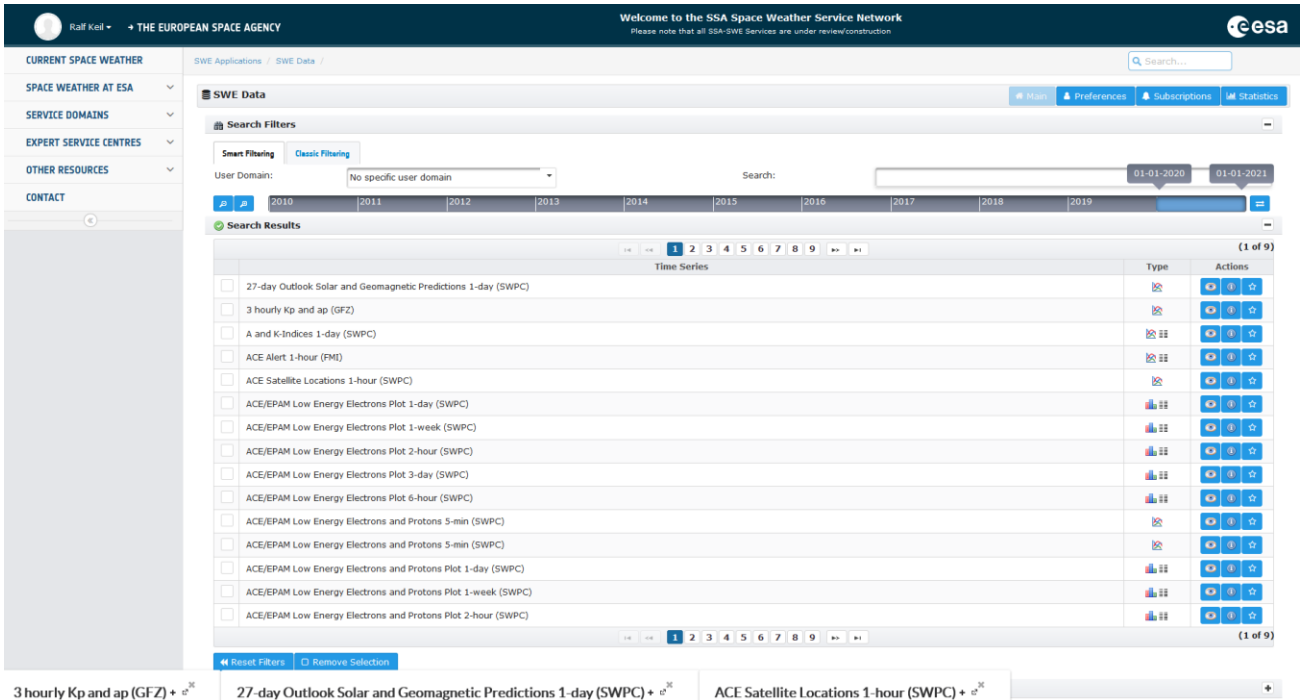
Figure 35: Data Viewer Minimised

4.5.2.7.5 *Restore a Minimised Data Viewer*

The viewer can be restored after being minimised by clicking on the restore button (+). It may also be maximised (see section below).

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4.5.2.7.6 *Maximise Data Viewer*

The user may maximise a Data Viewer by clicking on the maximise icon ( ). The viewer size is then extended to the full web page.
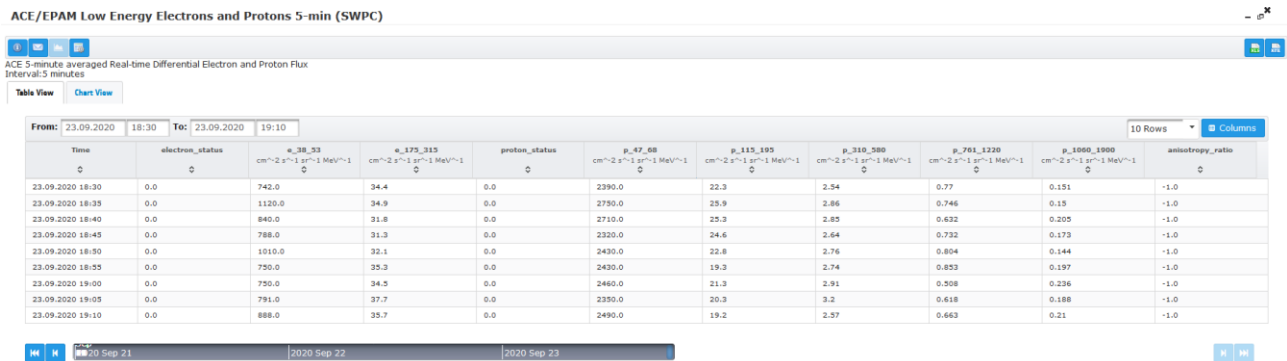
Figure 36: Data Viewer Maximised

4.5.2.7.7 *Move Data Viewer*

The data viewer window can be moved anywhere in the browser page, by clicking in the window header and executing a drag-and-drop.

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4.5.2.8 Data Viewer Menu Operations

4.5.2.8.1   Display Metadata Button

The user may display the metadata from the viewer by clicking on the information button (   ).

4.5.2.8.2   Execute Function Button

When clicking on the "execute function" icon (illustrated below), the user is prompted to specify the process function to execute on the data. Only the plotting function (Gnuplot) is currently available.
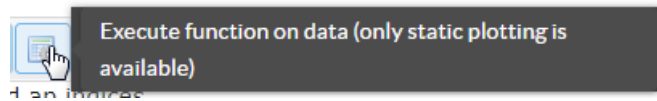
Figure 37: Data Discovery - Perform Function Button

As illustrated on the figure below, the user has to fill the input parameters of the analysis process.
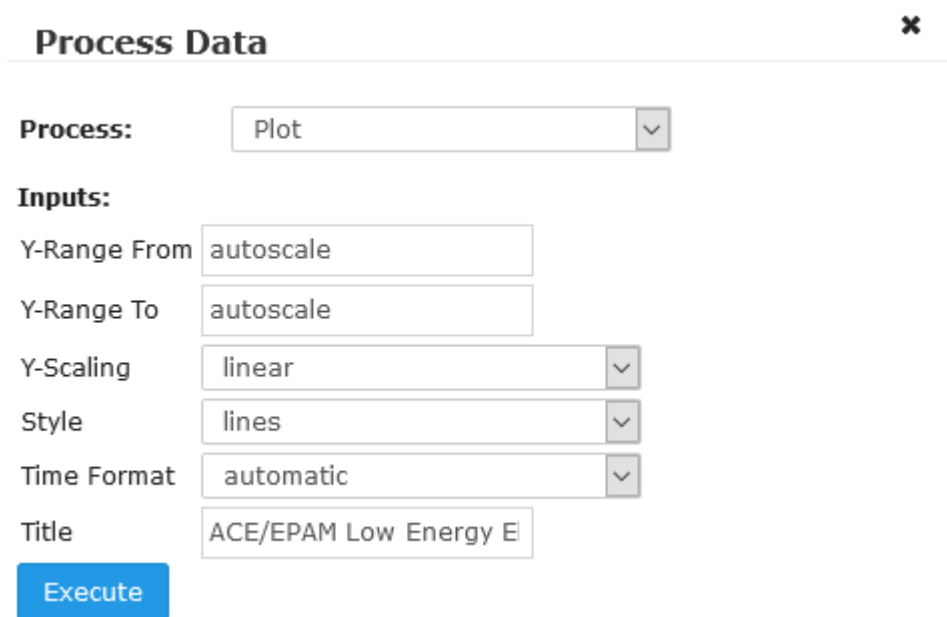
Figure 38: Data Discovery - Analysis Request

In the case of the Plot function[14], the user shall specify the chart style, y-range, y-scaling, the time format and chart title. Note also that the function only work on a single dataset.

The user shall click on the "Execute" button in order to display the result image.

---

[14] Only the *gnuplot* data analysis function (on a single dataset) is implemented as part of the SSA P2-SWE-XI activity. Other analysis functions such as data rebinning, superposed epoch analysis, running difference plots, comparison with reference event/environment, etc. should be implemented in the future.

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Note that the analysis is executed on data corresponding to the date pickers values of the current view.

When the process (e.g. the GnuPlot function) is executed, a message indicates the analysis is running.
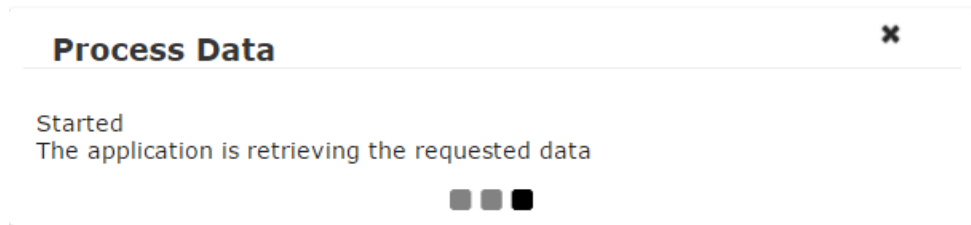
Figure 39: Data Discovery - Analysis Running Message

Then the result is displayed automatically to the user.
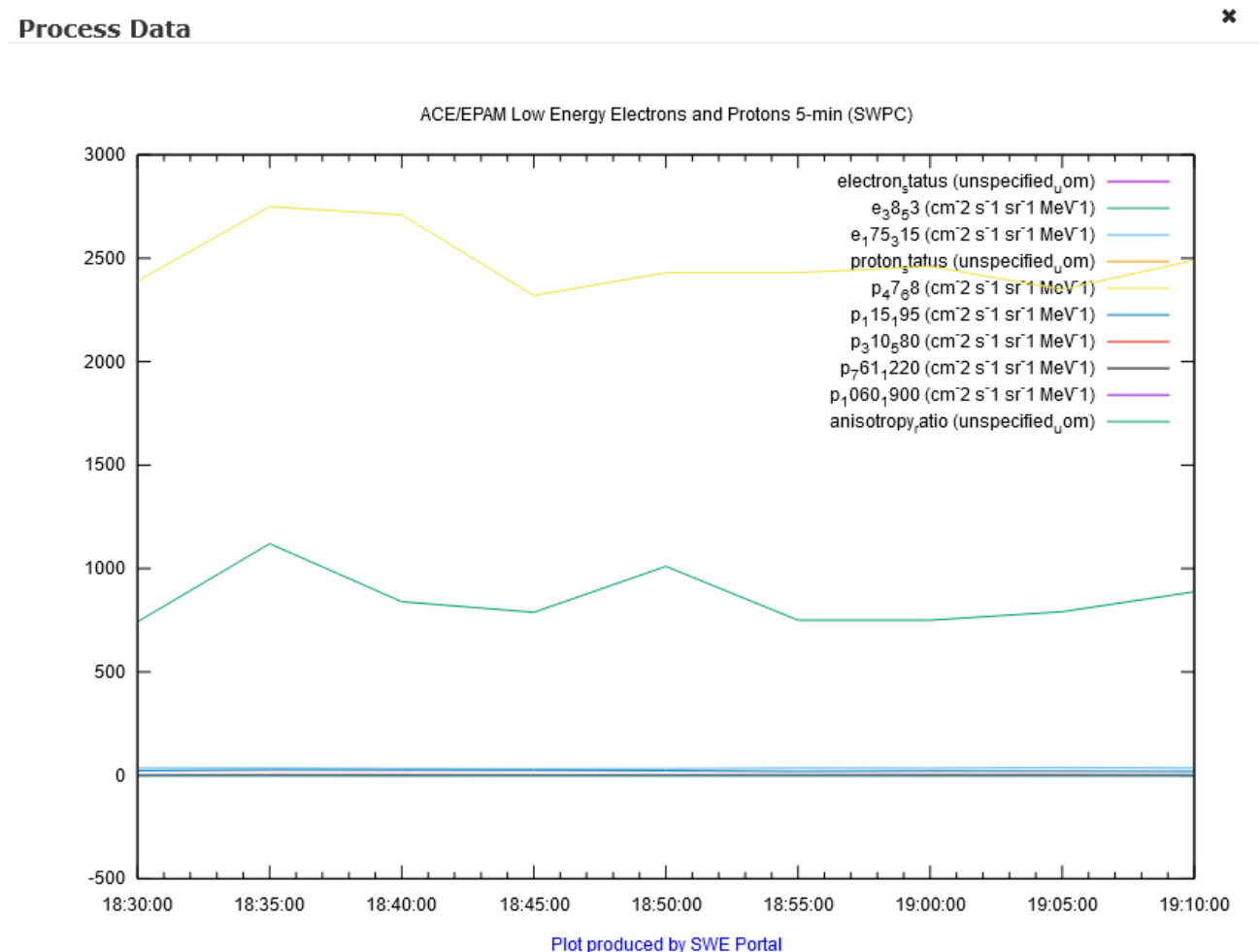
Figure 40: Data Discovery - Analysis

4.5.2.8.3 Subscribe to Data Button

When clicking the subscription button ( ), a floating window is displayed (as shown on the figure below).
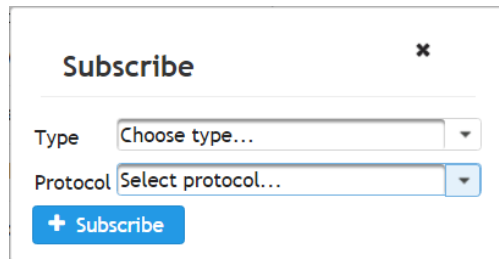
Figure 41: Data & Alert Subscription Initial Display

The user shall choose the subscription type (alert or data subscription), the format, the protocols, and the related sub-fields (e.g. Email address for the Email protocol).

In case of an alert subscription, the user should define a set of thresholds based on the field values.

Figure 42: Data & Alert Subscription

The user subscriptions may be managed on a dedicated Subscriptions Management page of the SWE Data Browser application described in section 4.5.2.14.

4.5.2.8.4 Display Metrics Button

The user may display the metrics available for a Time Series by clicking on the metrics button ( ). The button is only available when metrics exists for the particular dataset.

The list of metrics is displayed in a table. The metric values and related information are displayed when the user clicks in the specific row of metrics.

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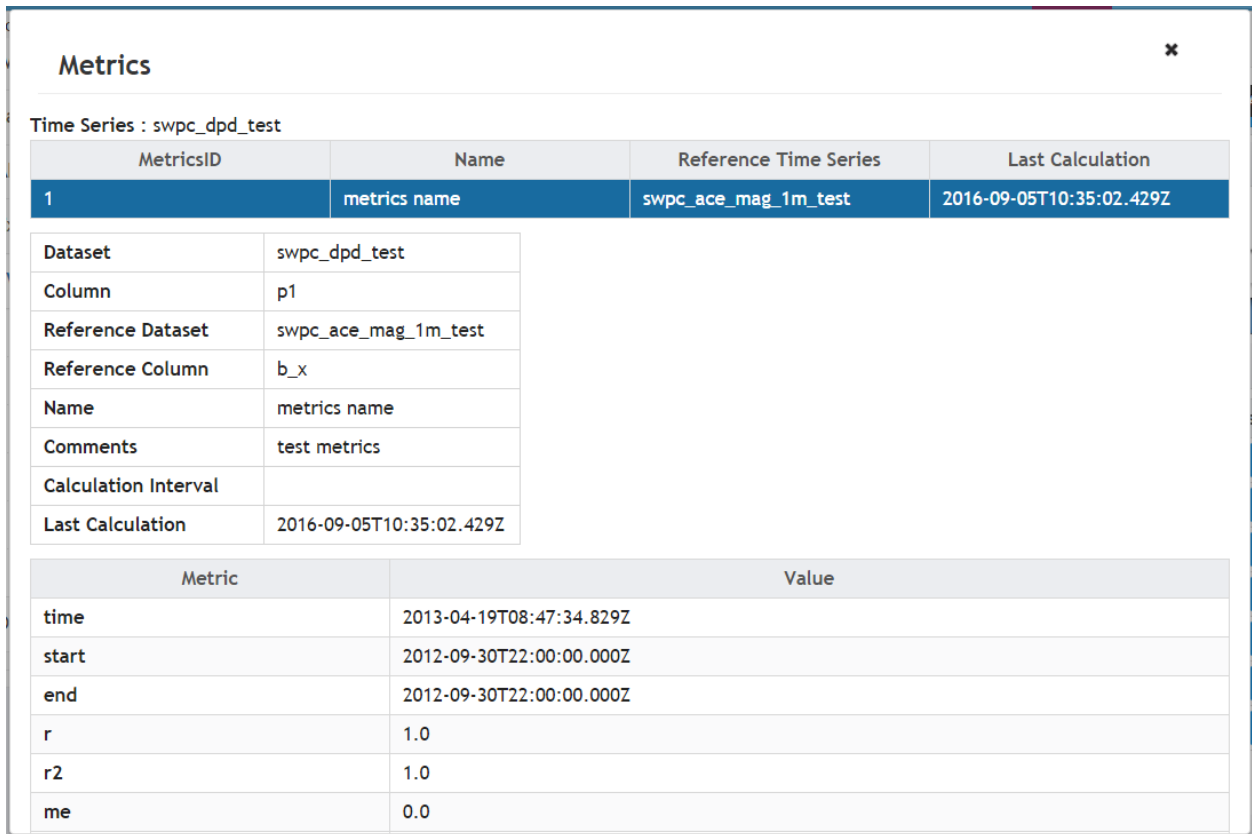
Figure 43: Metrics

4.5.2.8.5 *Export to XLS Button*

On the table view, the user may export data as an XLS sheet by clicking on the XLS button ( ). The filename includes the dataset name and the time range.

The exported XLS sheet header only contains the field names (but not the unit of measure).

4.5.2.8.6 *Export to XML Button*

On any view, the user may export the XML response by clicking on the export to XML button ( ).

The whole XML document returned by the GetData operation is displayed in the browser. The document may be saved on the local machine by using the browser save functionality (usually right-click anywhere on the page then choose "Save" in the displayed options).

Note that the saved data is in the Observation & Measurement format (ISO 19156 or OGC 10-004r3) and is encoded in XML according to the OGC 10-025r1 specification.

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4.5.2.8.7 Save Chart Button

On the chart view, the user may save the chart by clicking on the Save button (⬛). The filename includes the dataset name and the time range.

4.5.2.8.8 Print Chart Button

On the chart view, the user may print the chart by clicking on the Print button (⬛). The system printer dialog is displayed to configure the print options and to execute the print command.

4.5.2.9 Data Viewer Records Browsing

The data viewer always displays a partial set of records for a particular time range (also called time interval). The range is defined by a start date & time and an end date & time.

For each view, the data viewer displays on top of the selected view the time range start date and end date.

Figure 44: Data Viewer Time Range Pickers

And the data viewer also displays at the bottom of the selected view a time range slider as illustrated below.

Figure 45: Data Viewer Time Range Slider

The user can used both functionalities to select a new time range and navigate in the available data records.

Note carefully that, the table view and the binary views always display a constant number of records (e.g. 10 by default for the table view). When the user moves temporarily the time range, and only in case of gaps or missing values, the interval (duration) may be recalculated to ensure the constant number of records is preserved.

4.5.2.9.1 Select a Time Range using the Pickers

The date pickers allow the user to modify the range start or range end date & time by clicking on the different fields.

To modify the start or end date, the user shall click on the date field. The dialog illustrated below is shown, and the user may select a new date to modify the time range.
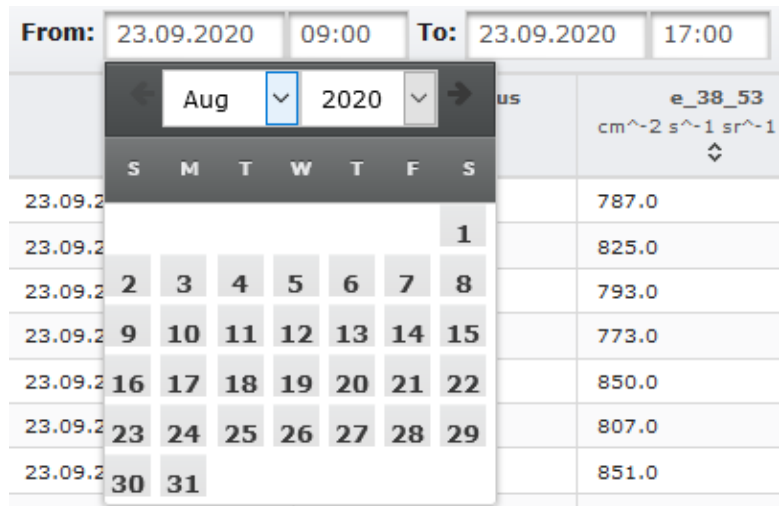
Figure 46: Data Viewer Date Picker

To modify the start or end time, the user shall click on the time field. The dialog illustrated below is shown, and the user may select the hour and minute of the desired start or end time.
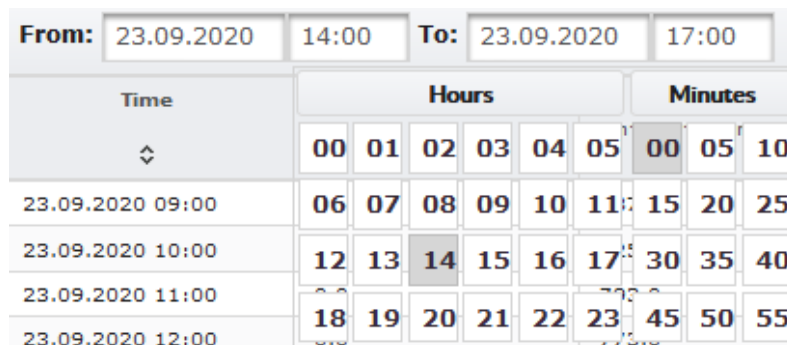
Figure 47: Data Viewer Time Picker

When the user modifies the date & time, the time period (duration) is preserved (except as explained in 4.5.2.9). Therefore the time range modification can be seen as a move over time (before or after the initial range).

In the case of the Chart View, when the user modifies the end date & time, the time period (duration) is modified. Therefore, it allows the user to increase or decrease the time range duration. This behaviour is not available in other views, because they always display a constant number of records.

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4.5.2.9.2   Select a Time Range using the Slider

The time range slider allows the user to perform a quick temporal move by clicking on the indicator and dragging it to the desired time.

Figure 48: Time Range Slider Move

The time range duration is always preserved (excepted as explained in 4.5.2.9).

When modifying the selected range on the slider, the start date and end date of the selection is displayed on top of the indicator, as illustrated below.
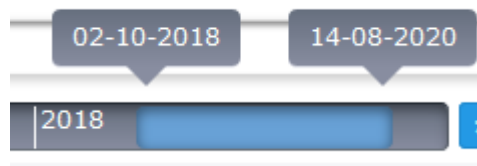
Figure 49: Time Range Slider Selection

The slider is surrounded by four buttons with the following purpose:

- Fast backward moves to the time range (identical period) to the first values

- Step backward moves to the time range (identical period) to the previous range (e.g. if the range is Saturday, the range will become Friday)

- Step forwards moves to the time range (identical period) to the next range (e.g. if the range is Saturday, the range will become Sunday)

- Fast backward moves to the time range (identical period) to the last values

In the case of the chart view, the user may also modify the range bounds by dragging the left side or right side of the indicator. Therefore, it allows the user to increase or decrease the time range duration.
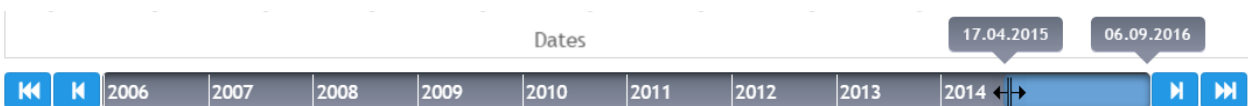
Figure 50: Time Range Slider Resize

4.5.2.10   Table View

In the viewer, the table view may be selected by clicking on the first tab (Table View). The records are displayed in a data table of 10 rows (by default). The latest 10 records are displayed initially.
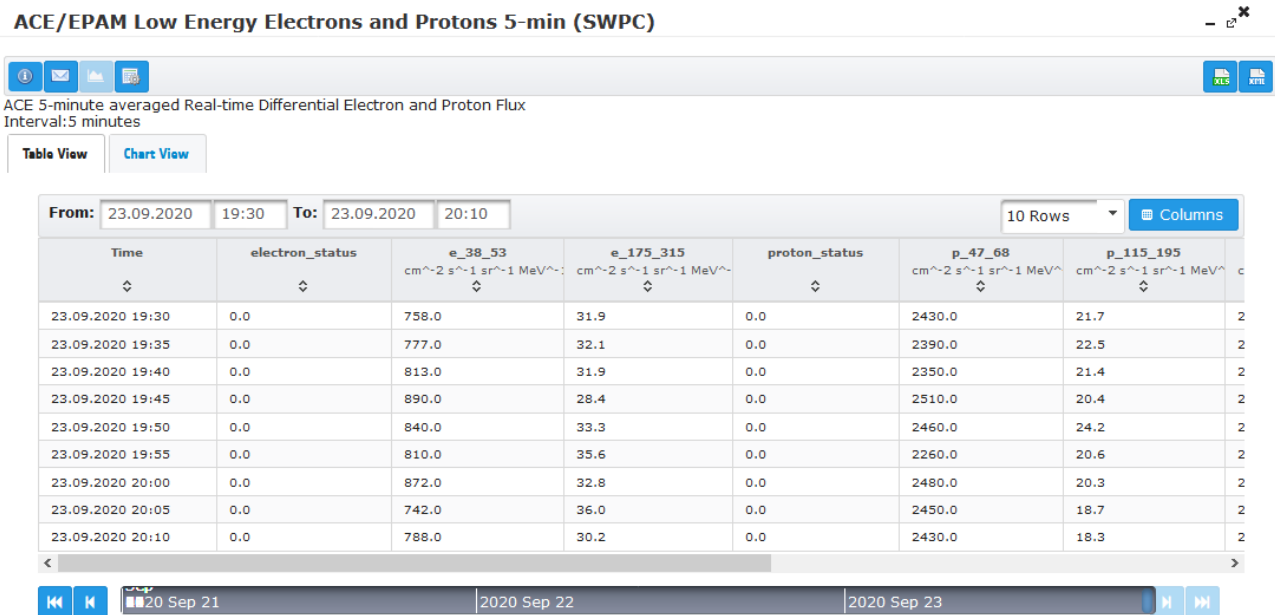
Figure 51: Table View

The table view consists of the following elements:

- Header row
- Columns headers
- Records table
- Time Range Browser

The header row shows, on the left, the time range start date and end date of the records displayed in the table. On the right, the rows selector and the columns selector are available.
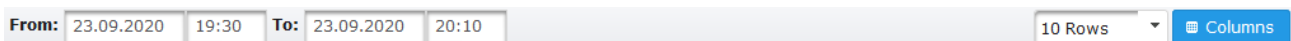
Figure 52: Table View Header Row

The columns headers display the field name and the unit of measure of the different dataset fields.

Figure 53: Table View Columns Headers

The dataset records are displayed in the table. At the bottom, a scrollbar is displayed when the number of columns is too high (and leads to an overflow).

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23.09.2020 19:30	0.0	758.0	31.9	0.0	2430.0	21.7	2
23.09.2020 19:35	0.0	777.0	32.1	0.0	2390.0	22.5	2
23.09.2020 19:40	0.0	813.0	31.9	0.0	2350.0	21.4	2
23.09.2020 19:45	0.0	890.0	28.4	0.0	2510.0	20.4	2
23.09.2020 19:50	0.0	840.0	33.3	0.0	2460.0	24.2	2
23.09.2020 19:55	0.0	810.0	35.6	0.0	2260.0	20.6	2
23.09.2020 20:00	0.0	872.0	32.8	0.0	2480.0	20.3	2
23.09.2020 20:05	0.0	742.0	36.0	0.0	2450.0	18.7	2
23.09.2020 20:10	0.0	788.0	30.2	0.0	2430.0	18.3	2

Figure 54: Table View Records

At the bottom, the time range slider is shown (see details in 4.5.2.9)

| 2020 Aug 26 | 2020 Aug 31 | 2020 Sep 5 | 2020 Sep 10 | 2020 Sep 15 | 2020 Sep 20 |

4.5.2.10.1 *Modify Number of Table Rows*

The table rows are displayed using a pagination mechanism (only a subset is displayed at the same time). The user may modify the number of rows displayed in a data table page by clicking on the rows menu selection on the right. A scroll bar is added on the right if the height of the table becomes too high.
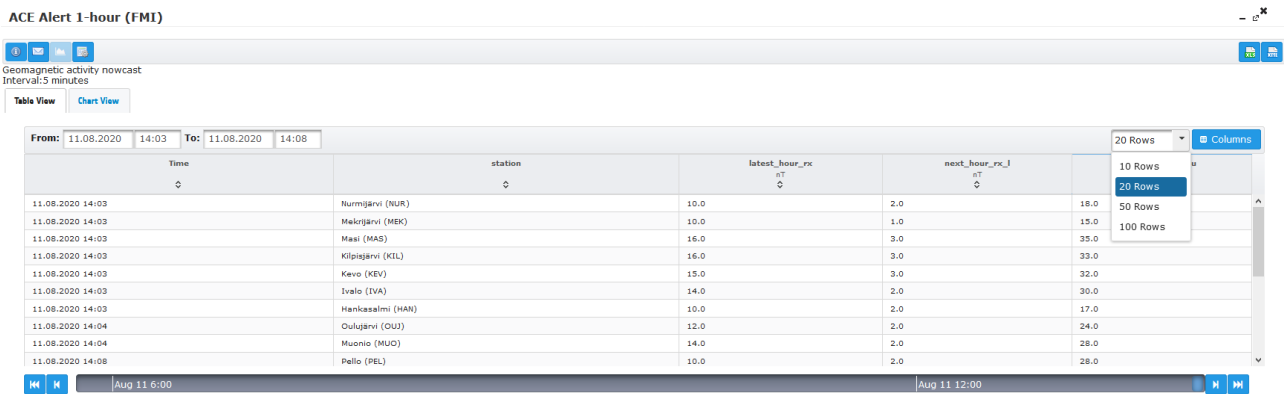
Figure 55: Table View Rows Count

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4.5.2.10.2 Column Sorting

When using a desktop device, it is possible to sort the subset of displayed data.

The user shall click on the relevant column header, and the list is automatically sorted in ascending order by using this field. By clicking again on the same field, the rows will be then sorted in descending order.

ACE/EPAM Low Energy Electrons and Protons 5-min (SWPC)

ACE 5-minute averaged Real-time Differential Electron and Proton Flux
Interval: 5 minutes

Table View   **Chart View**

From: 23.09.2020 10:00 **To:** 23.09.2020 18:00

Time	electron_status	e_38_53 cm^-2 s^-1 sr^-1 MeV^-1	e_175_315 cm^-2 s^-1 sr^-1 MeV^-1	proton_status	p_65_112 cm^-2 s^-1 sr^-1 MeV^-1	p_112_187 cm^-2 s^-1 sr^-1 MeV^-1
23.09.2020 18:00	0.0	855.0	33.4	0.0	2470.0	22.0
23.09.2020 13:00	0.0	850.0	32.6	0.0	2400.0	20.8
23.09.2020 11:00	0.0	793.0	32.3	0.0	2410.0	21.6
23.09.2020 15:00	0.0	851.0	32.3	0.0	2550.0	23.8
23.09.2020 10:00	0.0	825.0	31.4	0.0	2410.0	21.7
23.09.2020 17:00	0.0	830.0	31.4	0.0	2720.0	24.7
23.09.2020 12:00	0.0	773.0	31.2	0.0	2430.0	21.8
23.09.2020 14:00	0.0	807.0	31.0	0.0	2430.0	20.4
23.09.2020 16:00	0.0	866.0	30.4	0.0	3160.0	29.6

| 2020 Aug 26 | 2020 Aug 31 | 2020 Sep 5 | 2020 Sep 10 |

Figure 56: Table View Sorting

Note that the option may be deactivated by the administrator.

4.5.2.10.3 Columns Selector

The user may modify the field selection by clicking on the Columns button on the right of the Header row. The procedure for selecting fields is described in the previous sections 4.5.2.6.4, 4.5.2.6.5, and 4.5.2.6.6.

Note that the selection is shared between table view and chart view, and the view is immediately updated when a field selection is modified. The button is not applicable on the binary view.

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Figure 57: Table View Columns Selector

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4.5.2.11   Chart View

In the viewer, the chart view may be selected by clicking on the second tab (Chart View). The records are displayed in a chart.

The data is not displayed entirely but using a pagination mechanism. Only a partial subset of data is displayed (defined by the time period set on top of the chart view).

The initial time period is based on the dataset records frequency. The number of initially displayed records may be the last 6 hours, last 24 hours, last 7 days, etc. depending on the dataset records frequency (e.g. the last 6 hours of data will be displayed for a dataset with a single minute frequency, while the last 12 months will be displayed for a dataset with a frequency of 3 days).

Figure 58: Chart View

The chart view consists of the following elements:

- Header row
- Chart
- Legend
- Time Range slider

The header row shows, on the left, the time range start date and end date of the records displayed in the chart. On the right, the chart type selector, the log scale axis button, and the columns selector are available.

Figure 59: Chart View Header Row

4.5.2.11.1   *Modify Chart Type*

The user may choose between the following values for the chart type:

- Line Chart
- Step Chart
- Point Chart

The line chart was illustrated above.

The step chart is illustrated below.
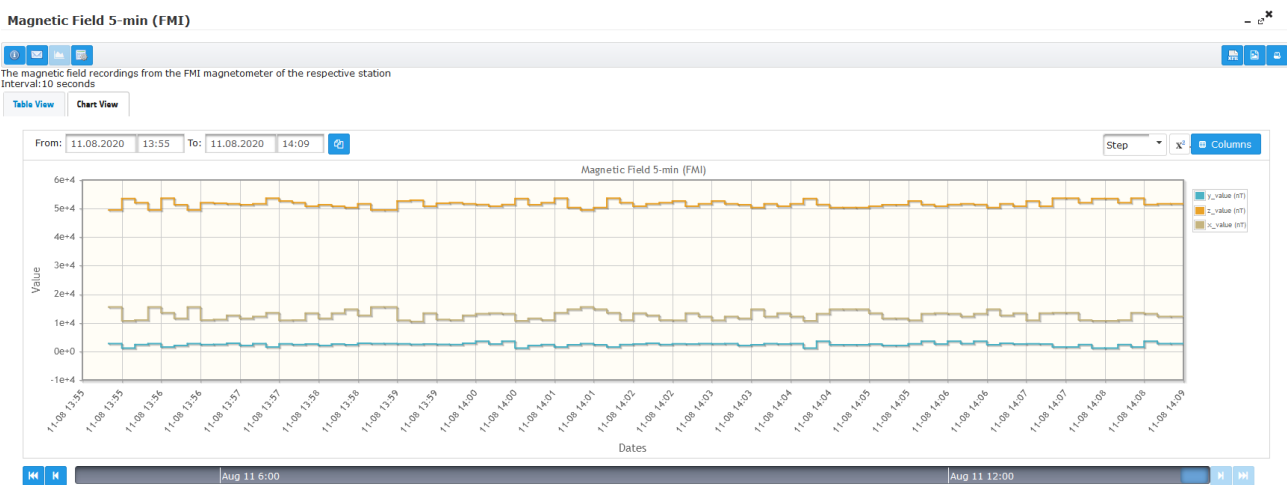
Figure 60: Step Chart

The point chart is illustrated below.

Figure 61: Point Chart

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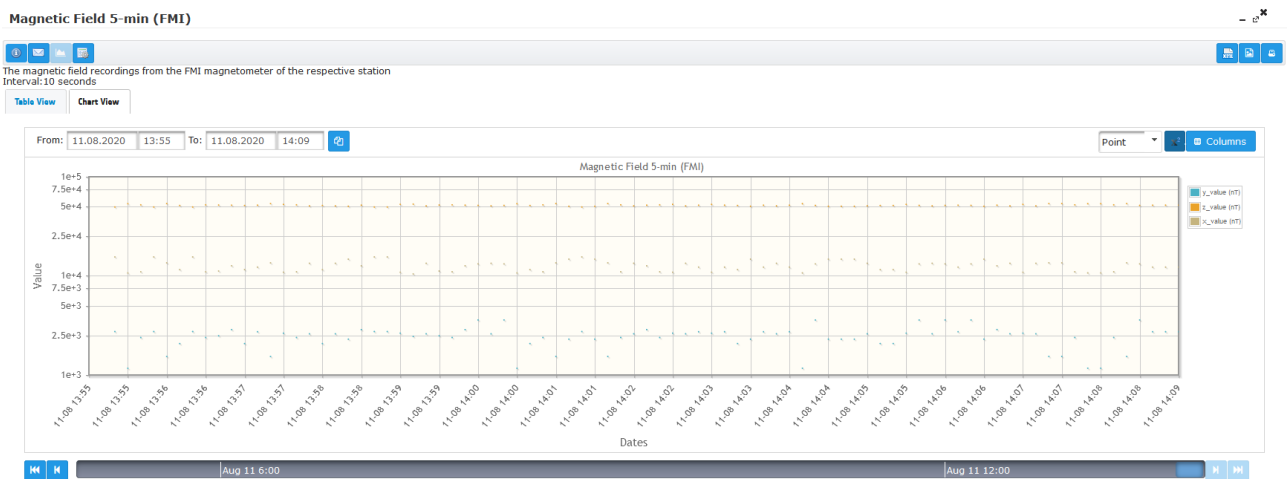
4.5.2.11.2 Copy Table View Time Range

The user may copy the time range used in the table view to visualize the corresponding data in the chart view by clicking on the « copy » button ( ).

Of course, this function is only available in the chart view.

4.5.2.11.3 Set Logarithmic Axis

The user may use a logarithmic (log 10) scale for the value axis by clicking on the Log button in the header row (x^2). The logarithmic axis mode is shown below.
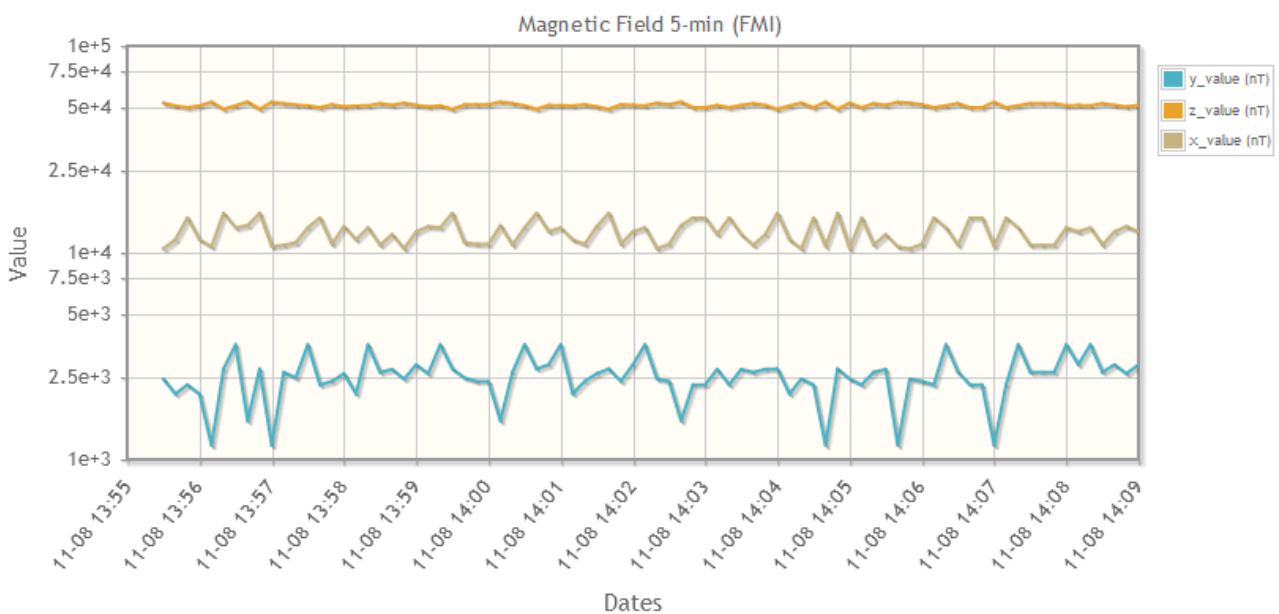
Figure 62: Chart with Logarithmic Axis

4.5.2.11.4 Record Highlighting

The user may display a particular record value by putting the mouse over a data point. As illustrated below, the corresponding field name, and the value are displayed in a box on top of the record point.
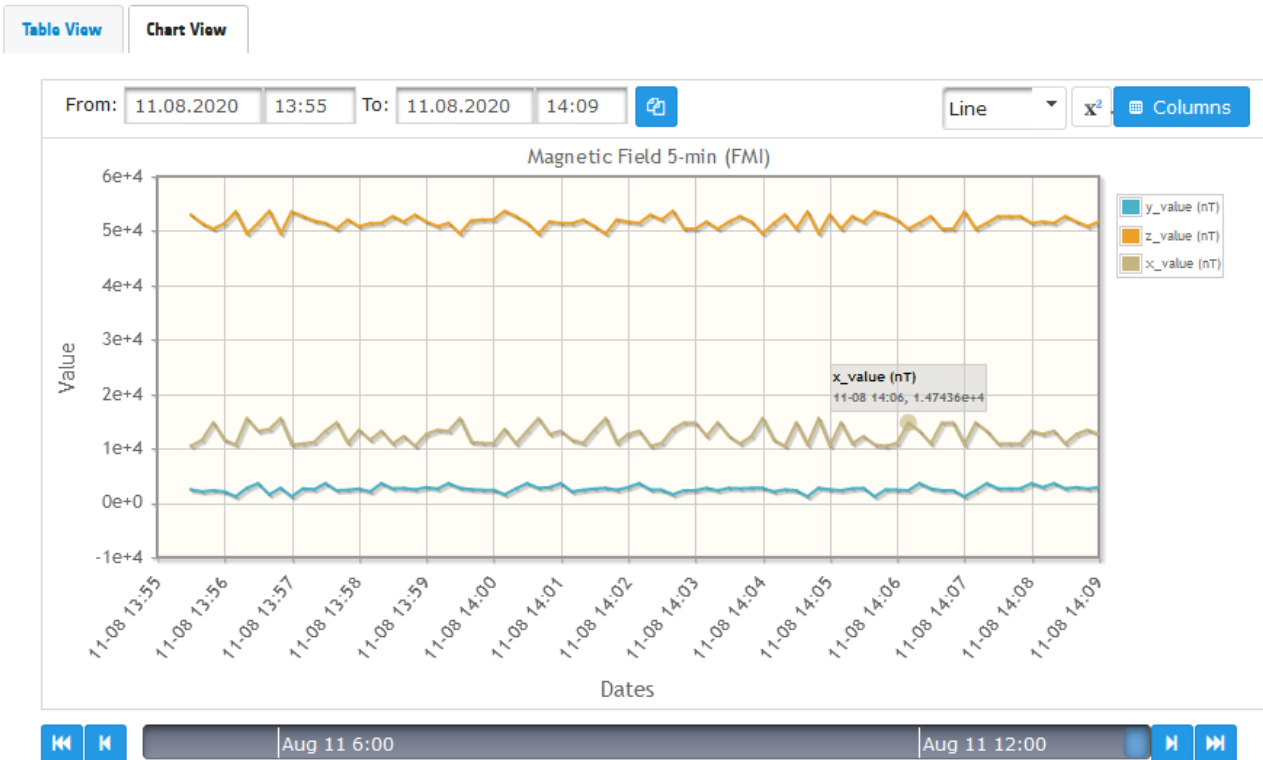
Figure 63: Chart View - Record Highlighting

4.5.2.11.5   Columns Selector

The user may modify the field selection by clicking on the Columns button on the right of the Header row. The procedure for selecting fields is described in the previous sections 4.5.2.6.4, 4.5.2.6.5, and 4.5.2.6.6.

 Note that the selection is shared between table view and chart view, and the view is immediately updated when a field selection is modified. The button is not applicable on the binary view.

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4.5.2.12   Binary View

There is a binary view for each of the binary field of the selected dataset (the user shall click on the binary view tab to display the corresponding field binary view). The binary view consists of the following elements:

- Header row
- Galleria (including thumbnails)
- Time Range Slider

The header row shows, on the left, the time range start date and end date of the records displayed in the table. On the right, the columns selector is available.

In the binary view, the various binary pictures are displayed by groups of 5 pictures. The user shall click on the desired thumbnail to display the picture individually.
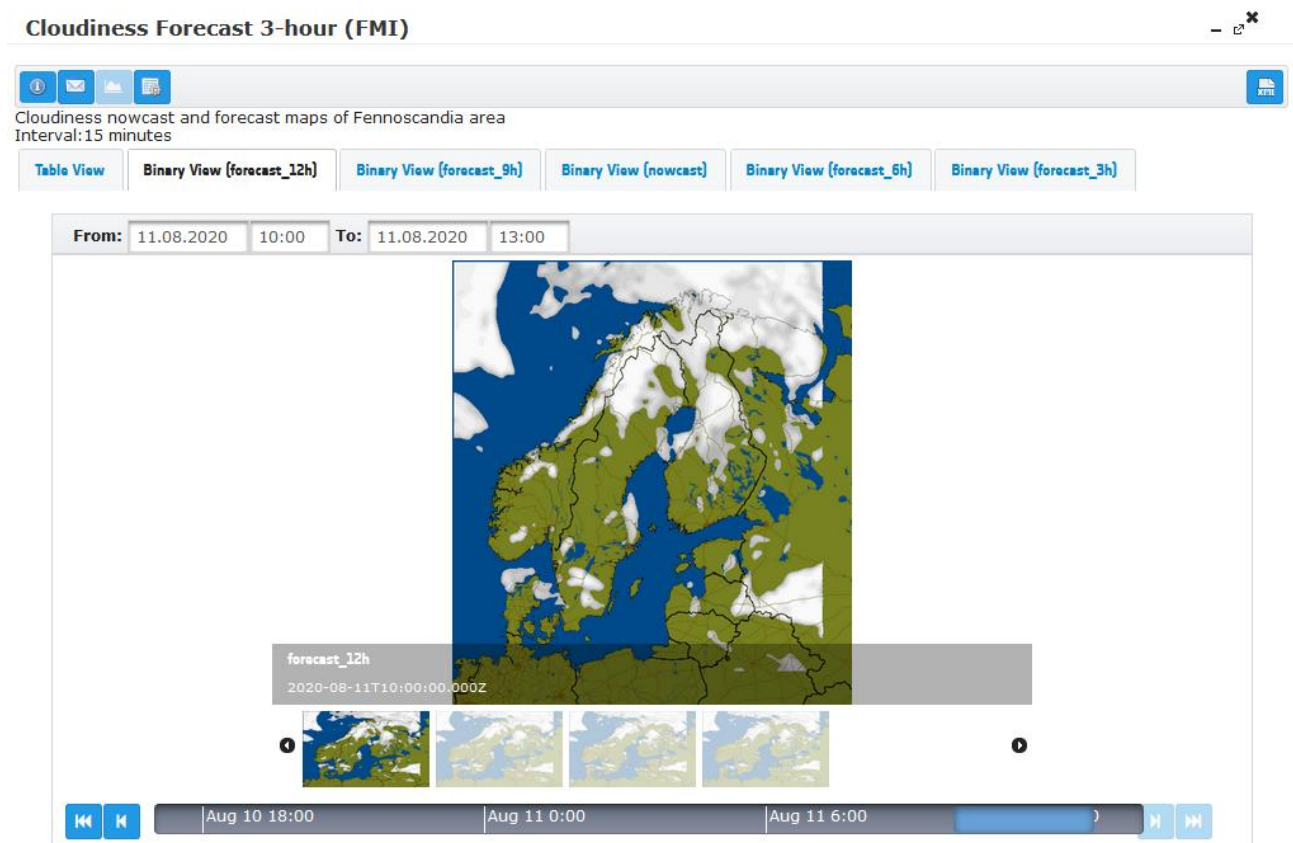
Figure 64: Data Display - Binary View

Using a desktop device, the user may also display the selected picture in a bigger frame. A button also allows him to print the displayed picture.

4.5.2.13   Modify Domain Preferences

The SWE Data Browser Application may be personalised on a dedicated user preferences page of the portal by clicking on the "Preferences" link in the application header.
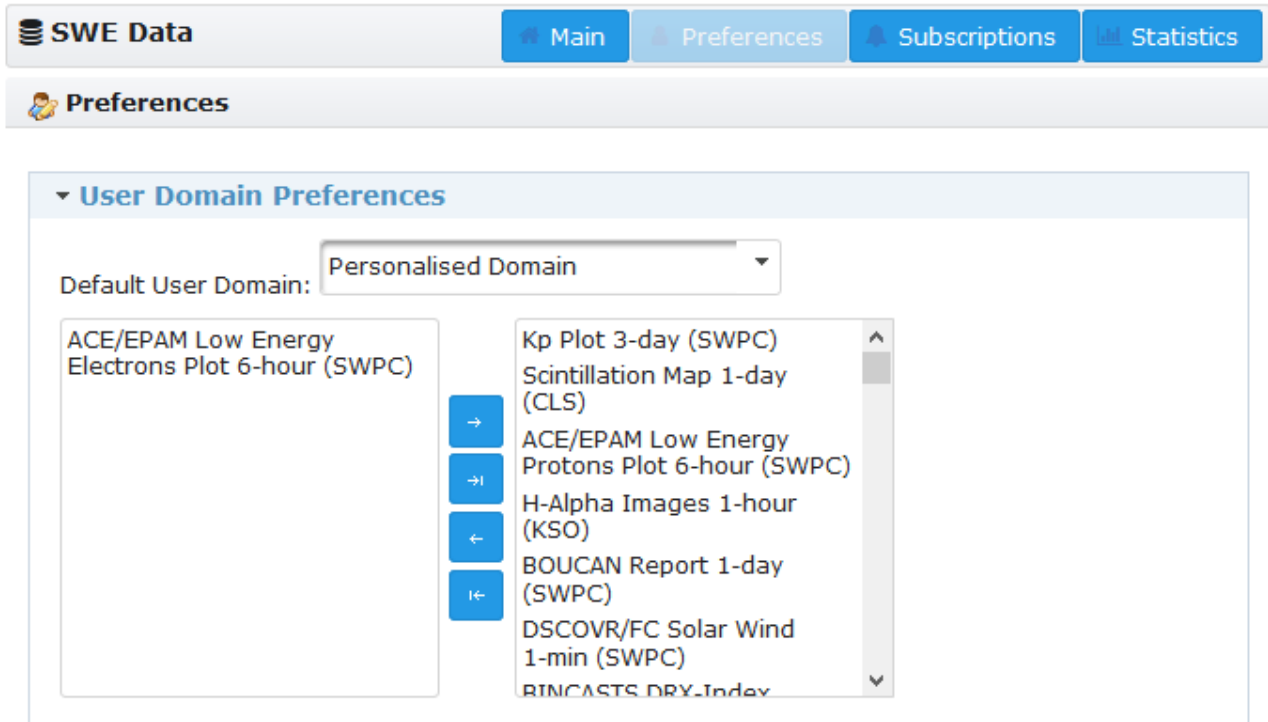
Figure 65: User Preferences Management - Default User Domain

The user may select a default user domain (not specific to a user domain) by clicking "No specific user domain". The user may rather select one of the user domains defined in Appendix A of [RD.3], or the "Personalised Domain". By default, the "All" is pre-selected.

Depending on the user domain selected, a specific order of available Time Series is applied on the Data Discovery interface.

Any preference change is immediately saved with a confirmation message briefly displayed as a notification.
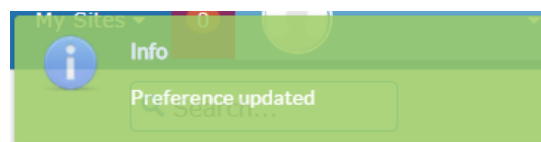
Figure 66: Preferences Change Notification

If the "Personalised User Domain" is selected, the sorting and list of data Time Series may be created and modified by the user as shown below.

The user is able also to add (or remove data) Time Series in his/her data Time Series list by moving the left Time Series list entries to the right (the opposite to remove entries). The user is able to define the sorting by moving up and down the elements of the right selection list.
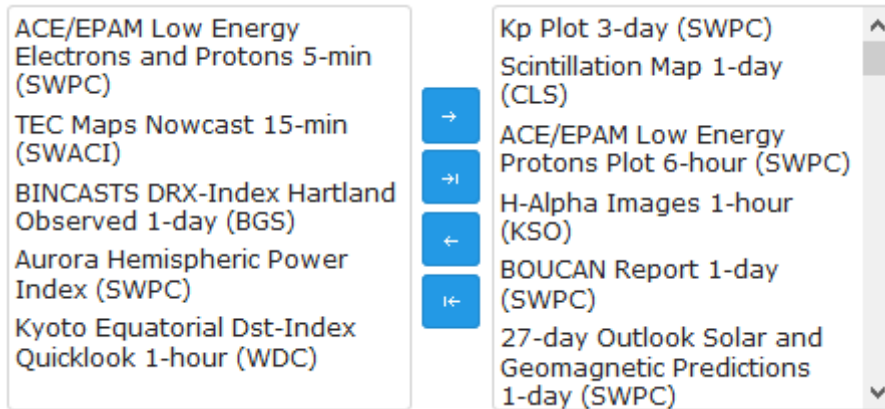
Figure 67: User Preferences Management - Personalised User Domain

4.5.2.14   Modify Subscriptions

The user may access the Subscriptions Management by clicking on the "Subscriptions" link in the application header.

Each subscription may be selected and modified by the user as shown on the figure below. Note that it is not possible to modify an alert subscription into a data subscription.

After any change of a subscription, the user shall click on the "Update" button. In order to delete a subscription, the user may click on "Delete" button.
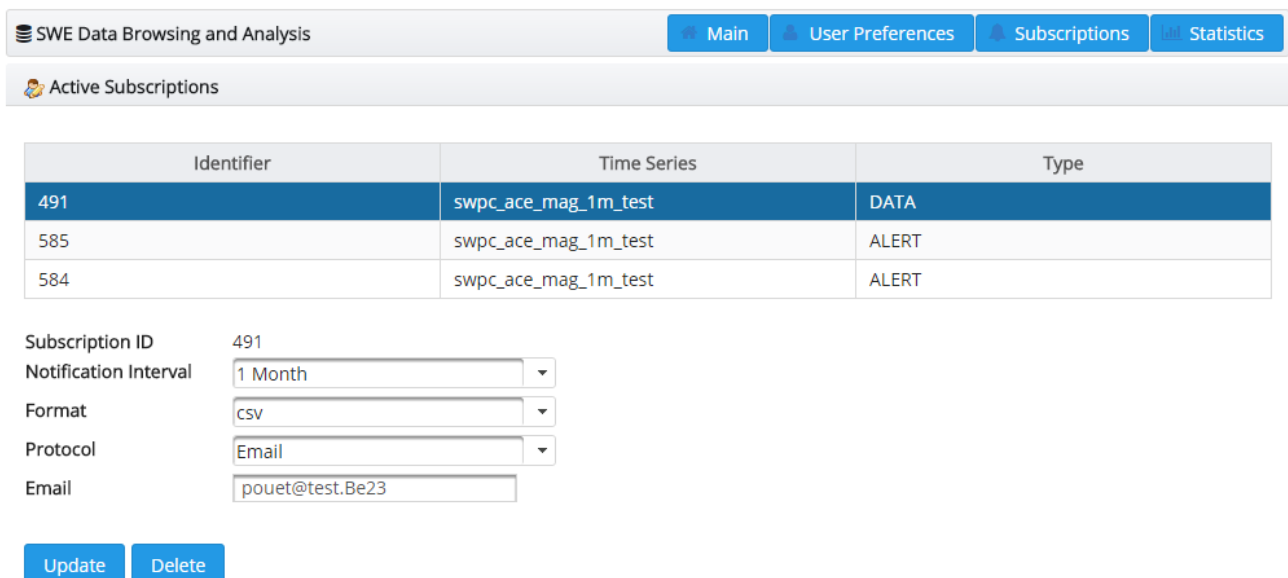
Figure 68: Subscriptions Management

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4.5.2.15   View Statistics

To display the Statistics page, the user shall click on the "Statistics" link in the application header.

The Statistics page contains the list of datasets, the update rate, data volume (i.e. number of records) and last update date & time. The list may be filtered by Data Provider.

Figure 69: Data Provider Statistics

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4.5.3   *Mobile Device Aspects*

The operations detailed in this manual consider a desktop device is used for browsing the Web portal pages. In the case of mobile devices (tablet or phone), the different screens are adapted to the reduced available size of the screen.

The following sections help the user to understand the necessary adjustments for these devices.

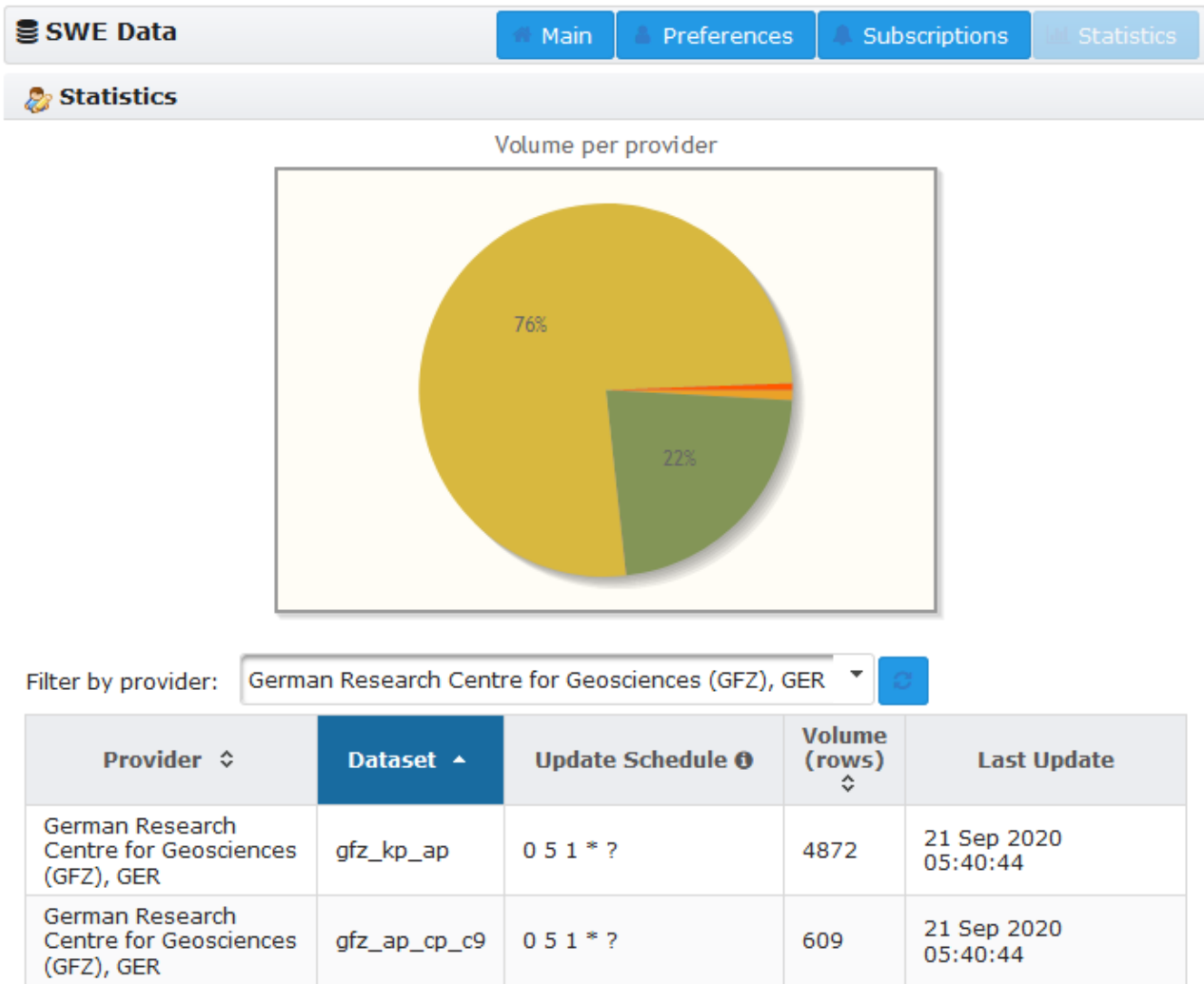Typically, the characters are printed larger and the buttons will be displayed bigger in order to facilitate finger touch selection.

On small screen, unessential information may be hidden, and functionalities are potentially not available as described in the following sections.

4.5.3.1 Menu

When the screen width is low (in particular on mobile devices), an optimized navigation menu is shown on top of the pages. The user shall click on the menu button in order to display the available navigation page.

Figure 70: Menu on Phone

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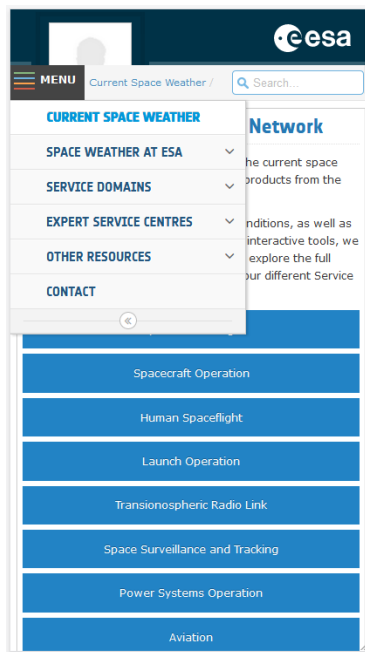
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Figure 71: Menu on Tablet

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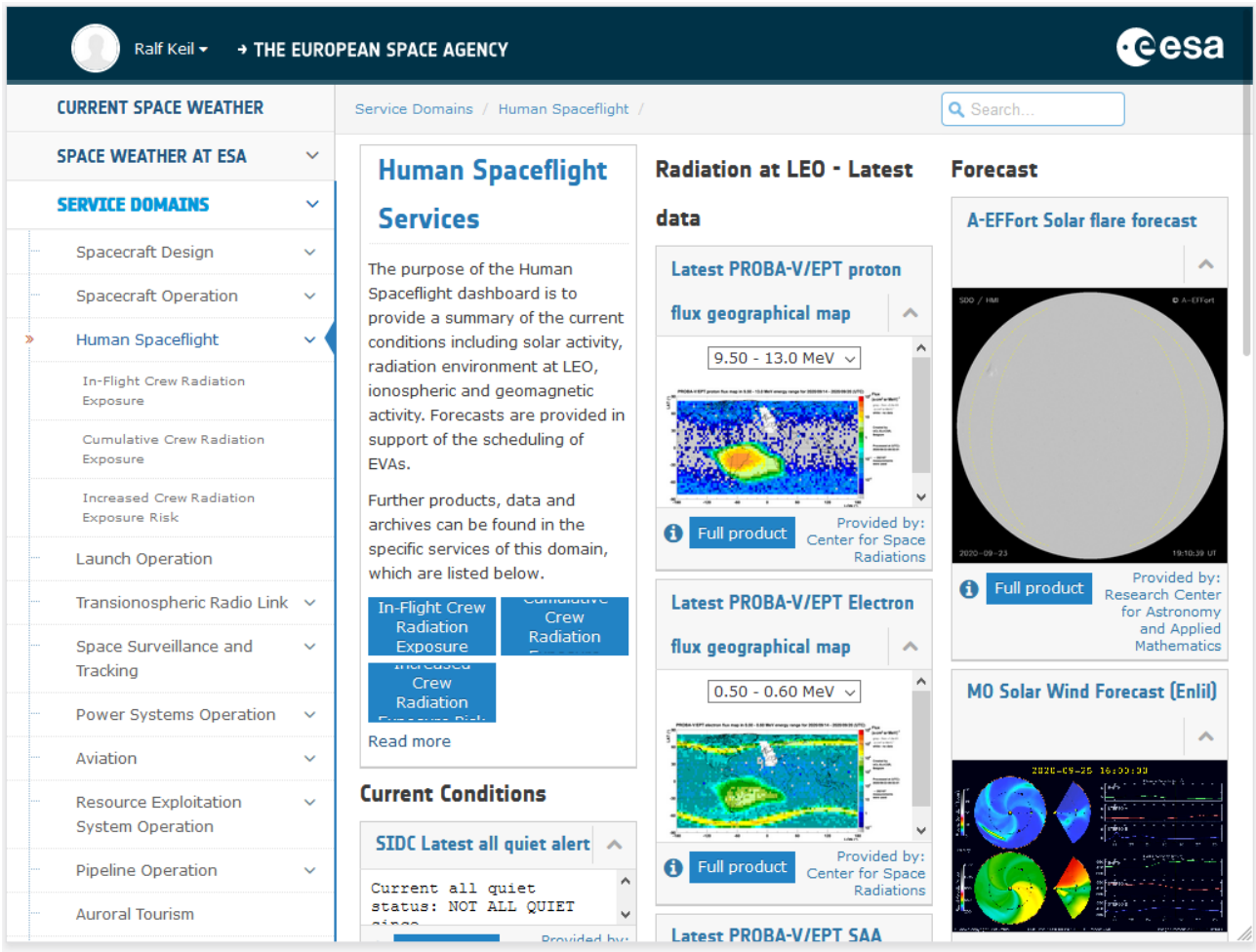### 4.5.3.2 Welcome Page

The welcome page is displayed with the same content as on desktop device. However, the different tiles are displayed one per row, beneath one other. As usual on mobile devices, the finger should be used for scrolling the page.

Figure 72: Welcome Page on Phone
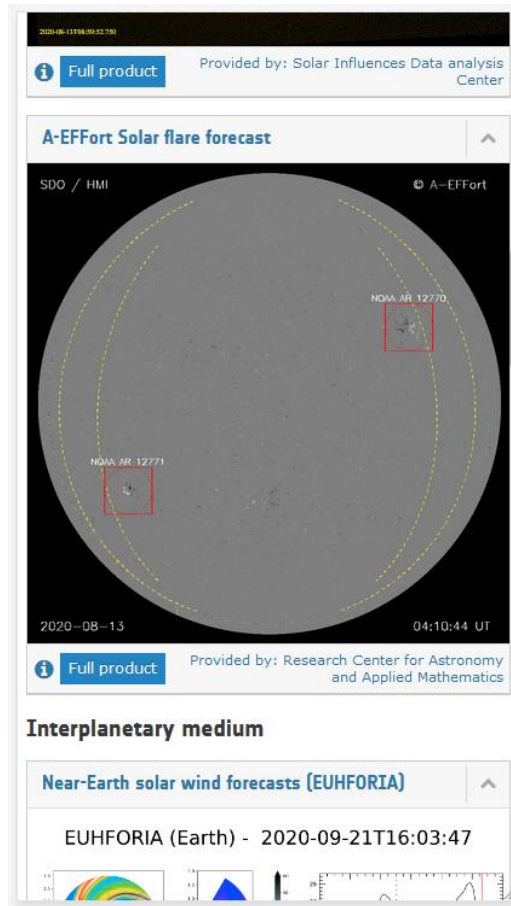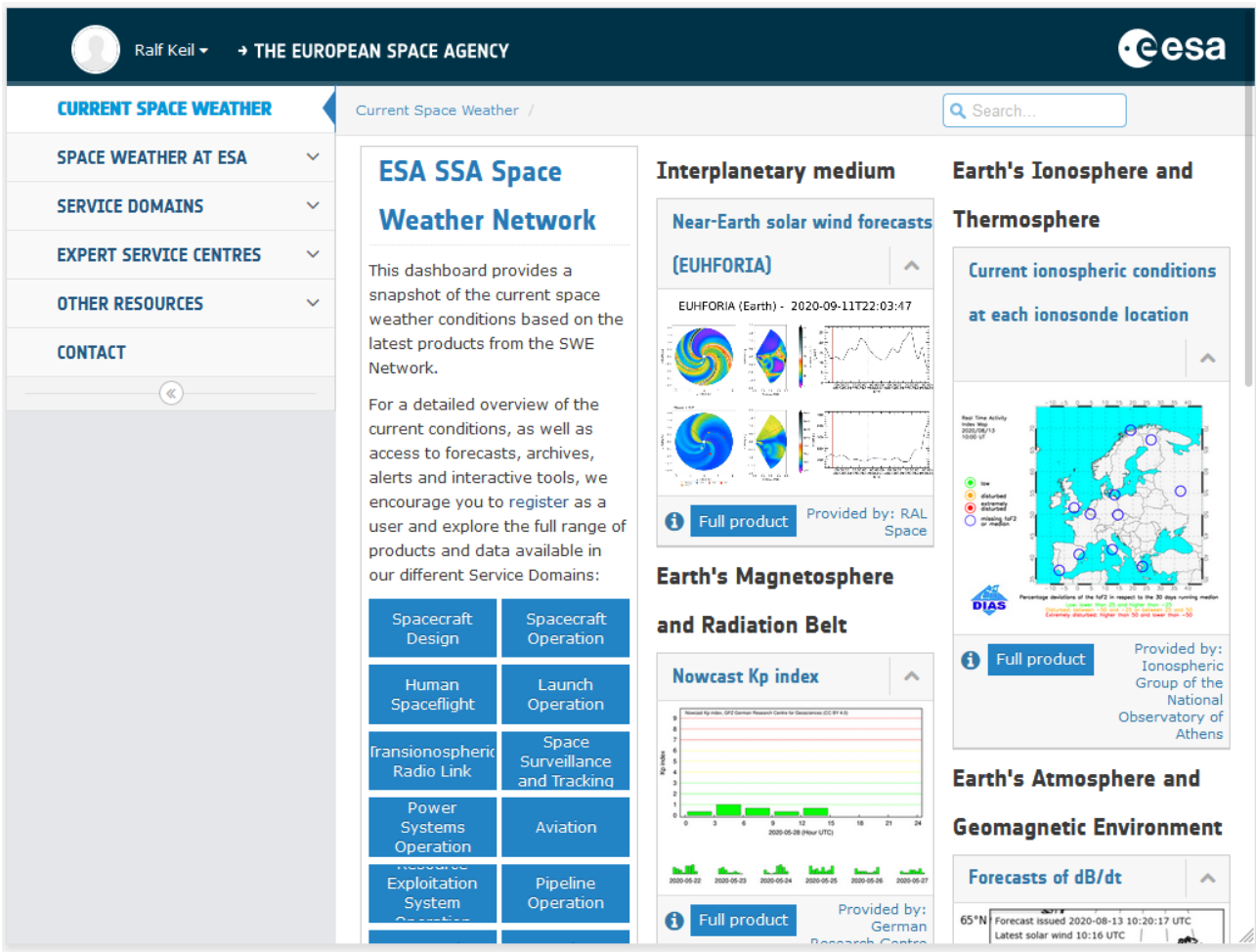
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Figure 73: Welcome Page on Tablet

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4.5.3.3 Content Pages

The different content pages are displayed as usual. As usual on mobile devices, the finger should be used for scrolling the page.
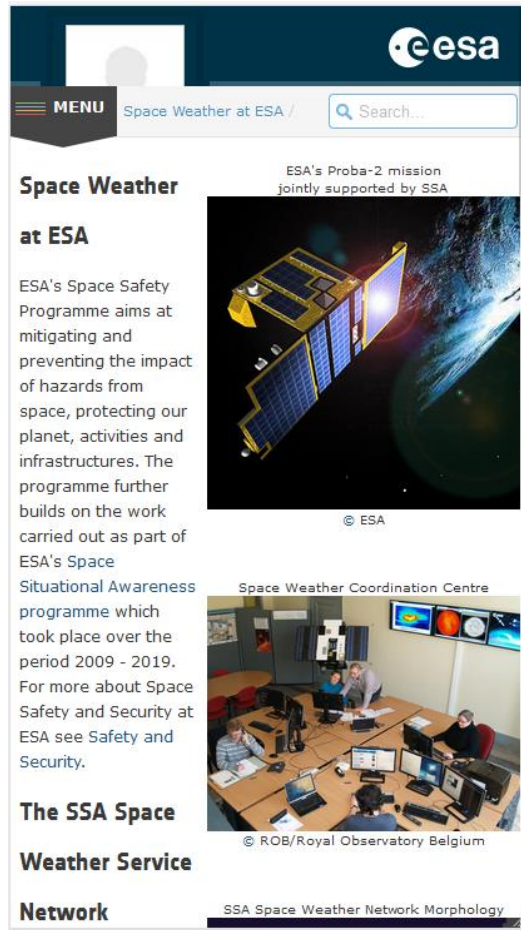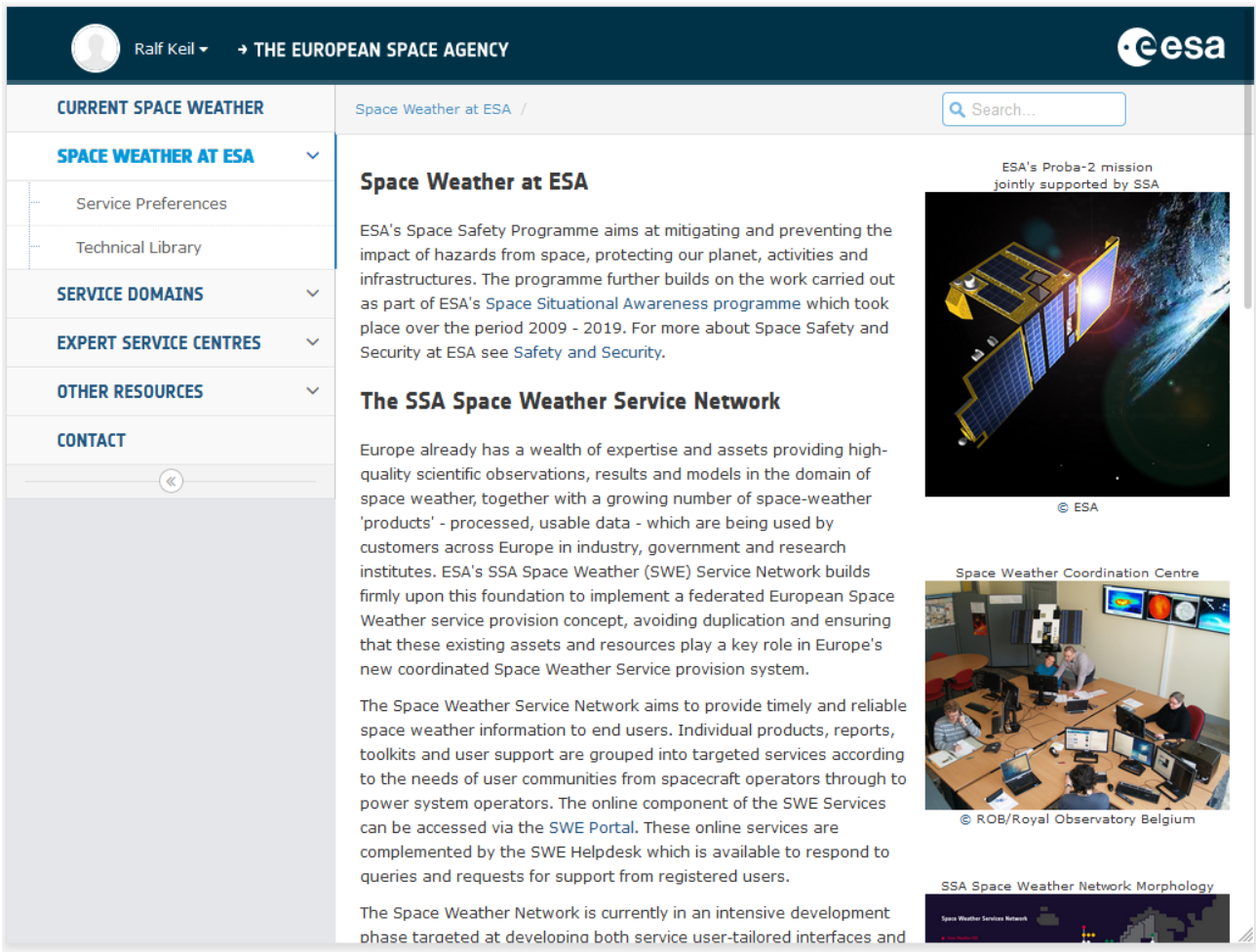

Figure 74: Content Page on Phone

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Figure 75: Content Page on Tablet

4.5.3.4 Templated Content

As for the welcome page, the different tiles of templated content are displayed one per row, beneath one other. Unessential information is in some minor cases also hidden on very small screens (e.g. phones).
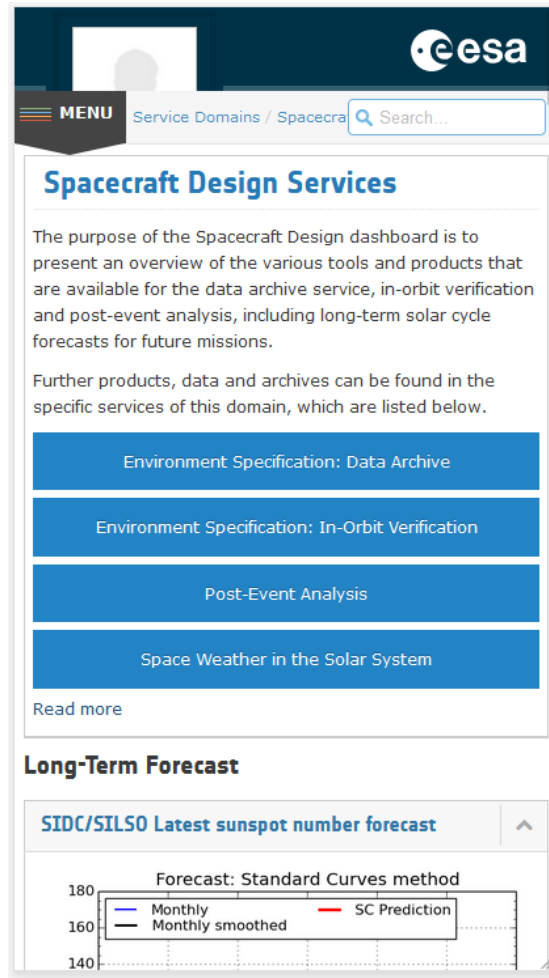

Figure 76: Service Domain Page on Phone

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Figure 77: Service Domain Page on Tablet

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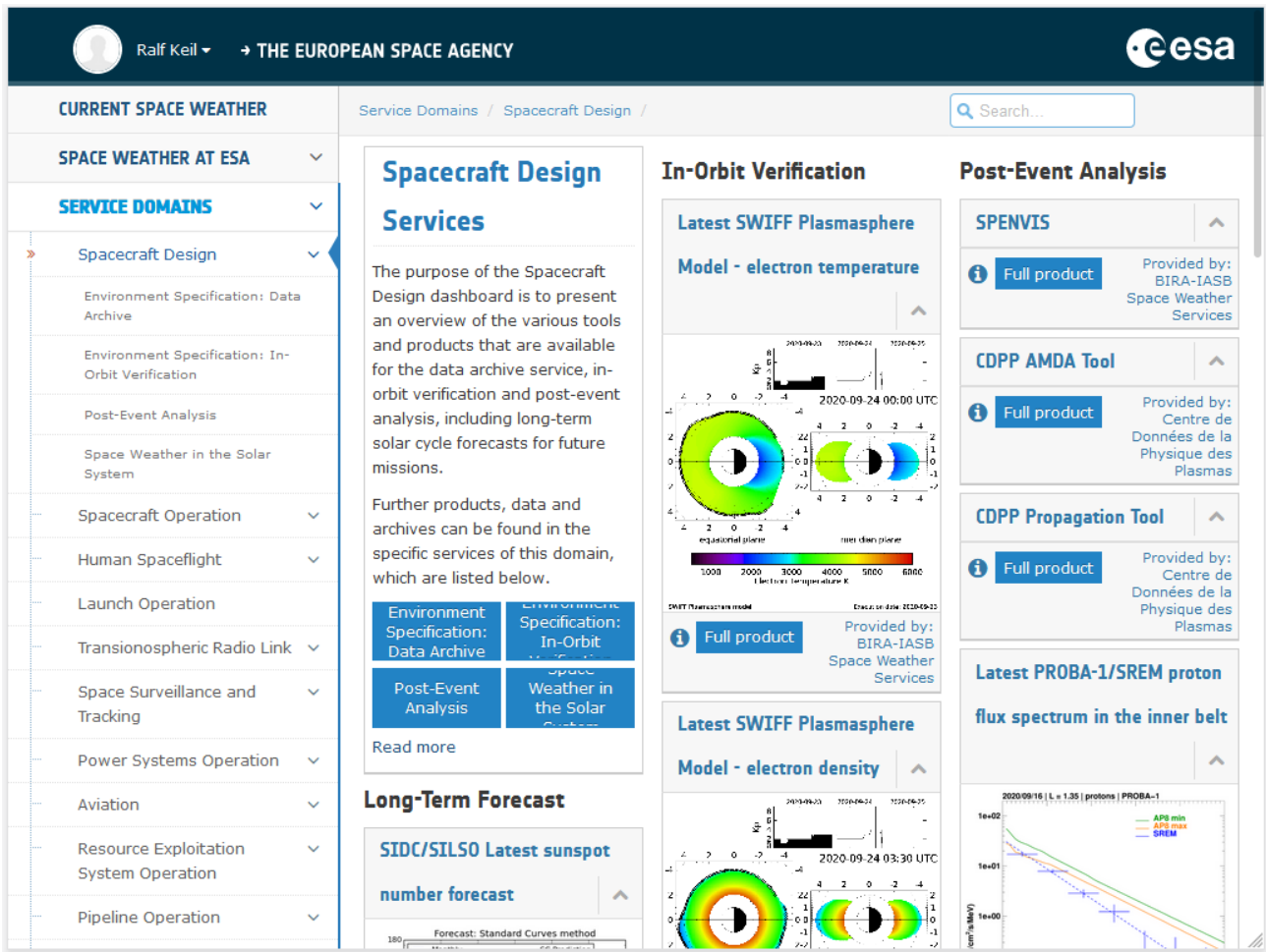
4.5.3.5 Data Browser Adaptations

When using a phone, only the very fundamental features of the applications are displayed. As shown on the figure below, when searching for datasets, only the name of the dataset is displayed to the user. Also, the filters are displayed using tabs (selected by touching with the finger), in order to reduce the space wasted by the filtering area.
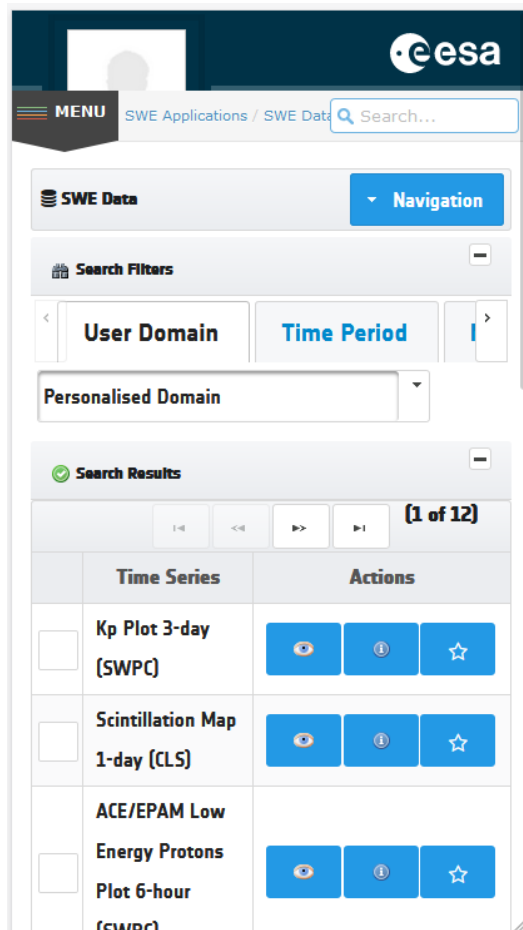
Figure 78: SWE Browser Search Results on Phone

When using a tablet, some additional features and buttons of the applications are displayed to the user. As shown on the figure below, when searching for datasets, the actions buttons are shown to the user. Depending on the screen width, the filters are optionally displayed using tabs.
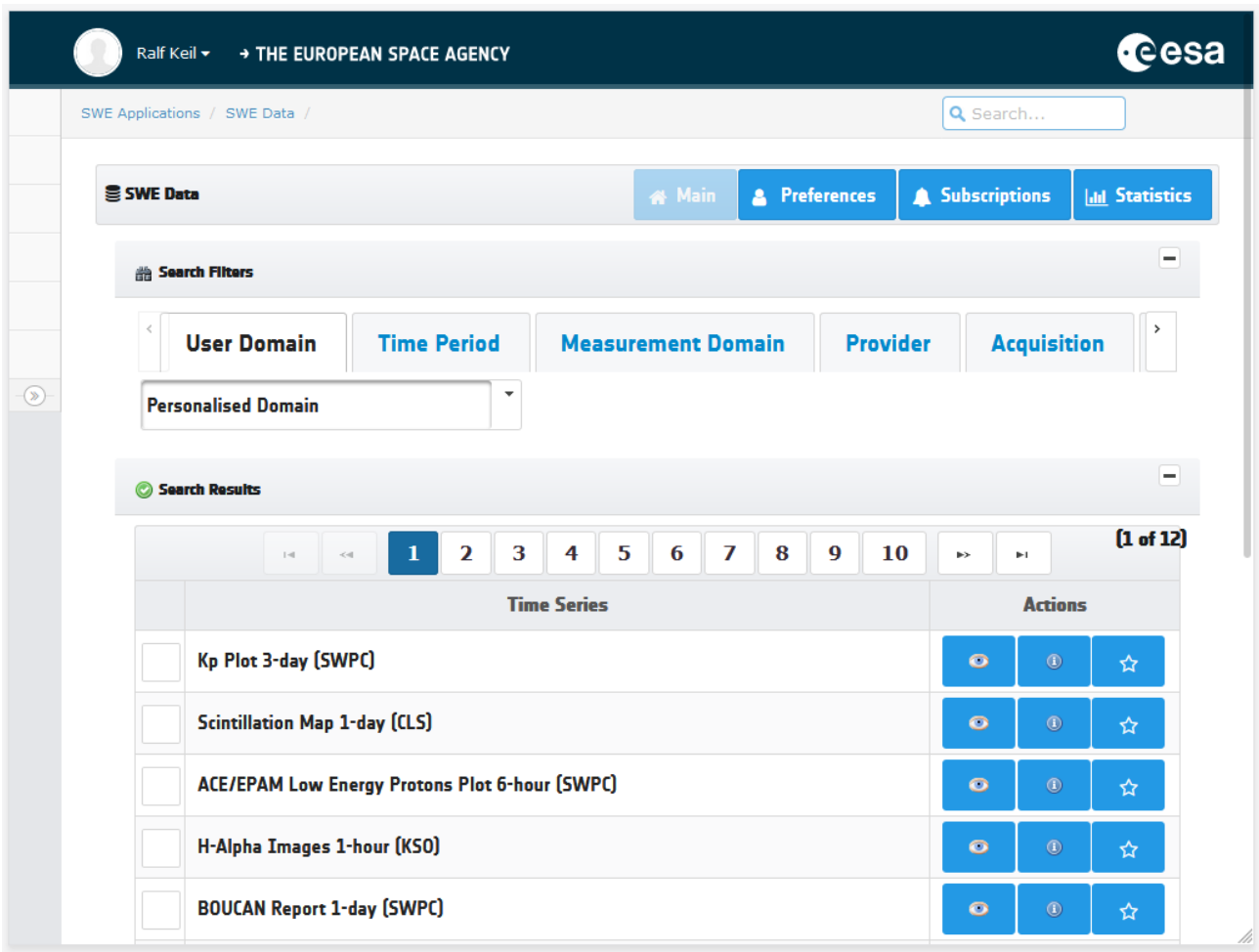
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Figure 79: SWE Browser Search Results on Tablet

The following figure illustrates the limited display of buttons and options when showing a viewer using a phone device (e.g. the time period slider is not displayed neither the chart options).
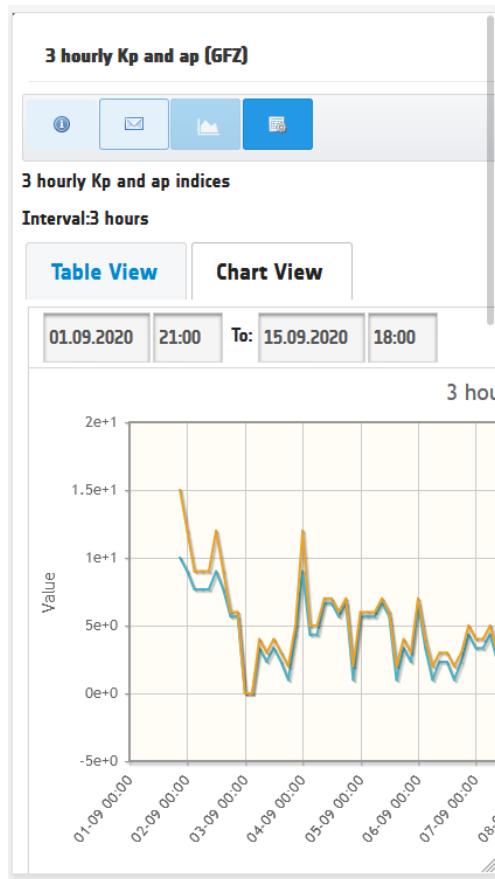
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Figure 80: SWE Browser Chart View on Phone

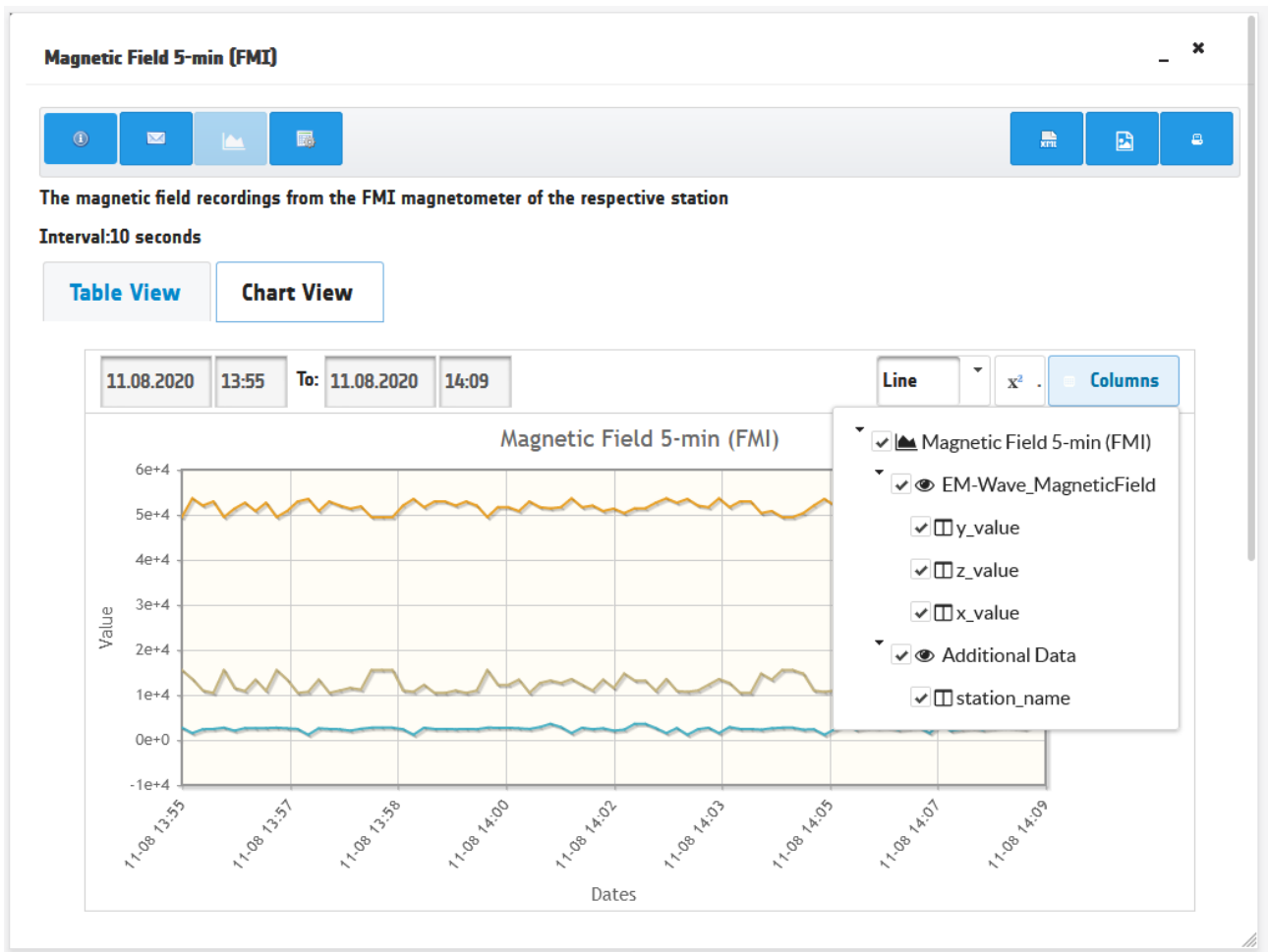The same behaviour happens using a tablet device with some more options (such as the chart draw type and the logarithmic display option).

Figure 81: SWE Browser Chart View on Tablet