OSCAR
Observing Systems Capability Analysis and Review Tool

- User Manual for OSCAR/Space and OSCAR/Requirements-

Updated in July 2021

TABLE OF CONTENTS

Document Change Record

Date	Nature of Change	Document version	Version corresponding to Application Version
25.01.21	First version v.1	1.0	2.5
20.07.21	Addition of Instrument filters, WIGOS sub component in gap analysis, Additional filters in gap analysis	2.0	2.6

INTRODUCTION

This document describes and explains the functionality of the web-based interface of the **Observing Systems Capability Analysis and Review Tool (OSCAR)** for the general public, focusing on two components: the Space-based Capabilities module (OSCAR/Space) and the Observation Requirements module (OSCAR/Requirements). The third component of OSCAR, which is dedicated to Surface-based Capabilities (OSCAR/Surface), is addressed in the separate **OSCAR/Surface User Manual**. In addition, the **OSCAR/Requirements Manual for Focal Points**, provides additional details on the management of observation requirements for designated focal points, who are responsible for maintaining and editing observation requirements in their respective area, with a dedicated account.

OSCAR/Space is a resource provided by WMO in support of Earth Observation studies and global satellite mission coordination. The information contained in OSCAR/Space is updated by the WMO Secretariat to the best of its knowledge, in close cooperation with space agencies and application experts. However, satellite systems and plans are continuously evolving. Neither WMO, nor the space agencies, nor any of their employees or contractors, makes any warranty on the data contents, or any assumed legal liability for the accuracy, completeness, or usefulness of this information.

It is underlined that the assessments contained in OSCAR/Space are performed according to objective criteria, based on instrument design characteristics, and submitted to validation by international expert teams (primarily the WMO/SC-ON Expert Team on Satellite Systems and Utilization). These assessments only reflect a relative, and generally qualitative, evaluation. This first level analysis does not replace a detailed analysis of instrument performances or a detailed evaluation of the quality of derived environmental data records that are actually available for a specific user application.

Information contained in OSCAR may be used freely. Publications using information from OSCAR should acknowledge WMO.

System Requirements

The web-application is platform-independent and can be accessed with any recent web-browser. JavaScript and Cookies need to be enabled for proper functionality. The application has been tested and is known to work with Internet Explorer 8 or higher, and with the two most recent versions of Firefox, Chrome or Safari. The application can be started by accessing https://space.oscar.wmo.int/.

Basic Structure

OSCAR as shown in Figure 1 consists of three modules, Observation Requirements, Satellite Capabilities, and Surface-based capabilities. These modules can be accessed by the general public via one single web-interface. A user manual for OSCAR/Surface is provided separately and outside the scope of this Manual. Users with special rights, such as WMO Focal Points or Administrators are able to maintain data in their respective field.

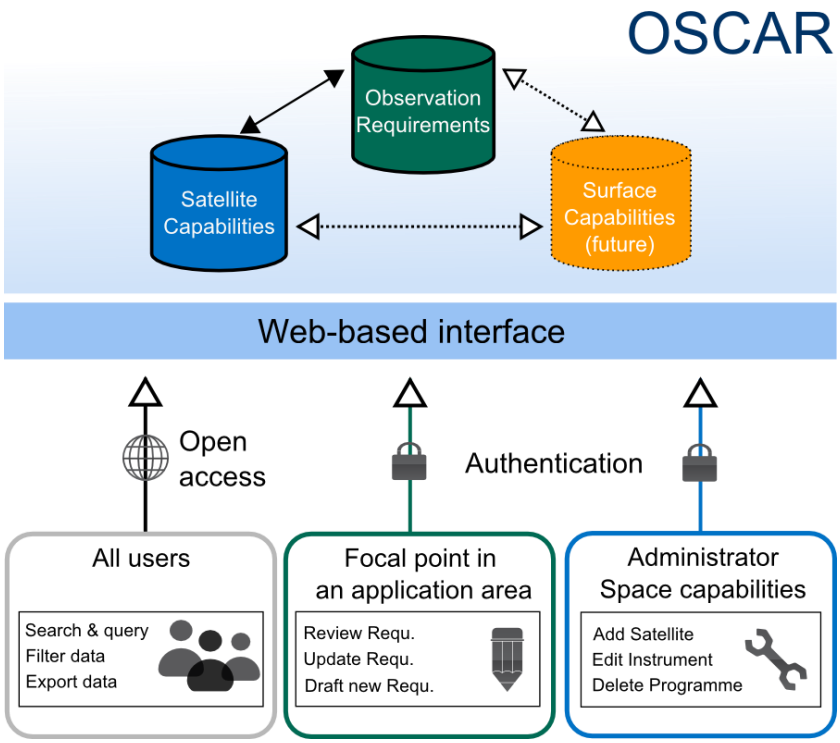


Figure 1: Basic Structure of OSCAR and examples of access

USING OSCAR/SPACE OR OSCAR/REQUIREMENTS

Home Page and Navigation

The first page users see consists of the head section (indicated as the green box in Figure 2), which includes a simple navigation bar and the login for registered users. This head section stays the same throughout OSCAR and allows direct access to all core content. The three main modules can be accessed from the navigation bar.

The content section (shown in red box) provides basic information about OSCAR

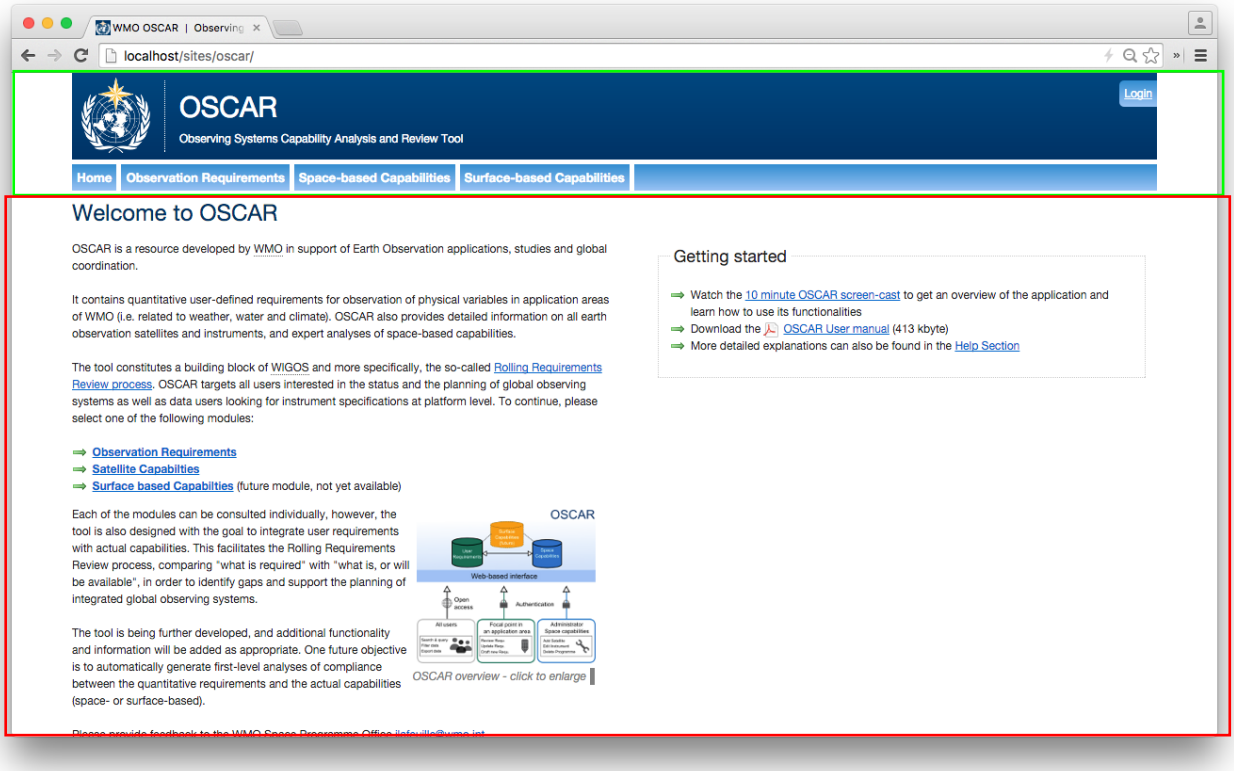


Figure 2: Home page of OSCAR.

Accessing data

There are two general ways of accessing data in OSCAR, either through the **"quick search"** – helpful if searching for any particular Variable, Instrument, Satellite etc, or via the **full data tables**, if the objective is to get an overview over multiple data items, with the possibility to then narrow the search with the use of filters.

"Quick Search"

The quick search box is located in the right top header, and is available in both modules (Observing Requirements and Space-based capabilities), but not on the homepage. This free-text search field (Figure 3) expects the name or partial name of either

- **Variable** or **Application Area** (when in the *Observing Requirements* module)
- **Satellite, Programme, Instrument, Instrument type, Capability, Space Agency** or **Variable** (when in the *Space-based capabilities* module)

The search will present possible matches in a structured list while typing. The search is started as soon as at least 2 characters are entered in the field.

The "quick search" not only takes the acronym and name fields into account, but also the description field (if such information is available). Therefore it is also possible to use keywords, if the exact name of an item is not known. For example, the term "lightning" will return the instrument "LMI".

As Figure 3 shows, the Search instantaneously returns some suggested results, trying to "guess" the user's intention (in this case, searching for "Aerosol Effective Radius"). As soon as these results pop up, it is possible to directly click on any item, which takes the user to the required page.

Figure 3: Free Text Search, searching for Term "aero"

Quick search also has features to show results on a dedicated search result page (Figure 4). For example, type the word 'aero' and press enter, this will redirect you to a dedicated page where you will find the same

search result that you are getting in Figure 4. This search page will show category wise search results, count of total findings, category wise count etc.

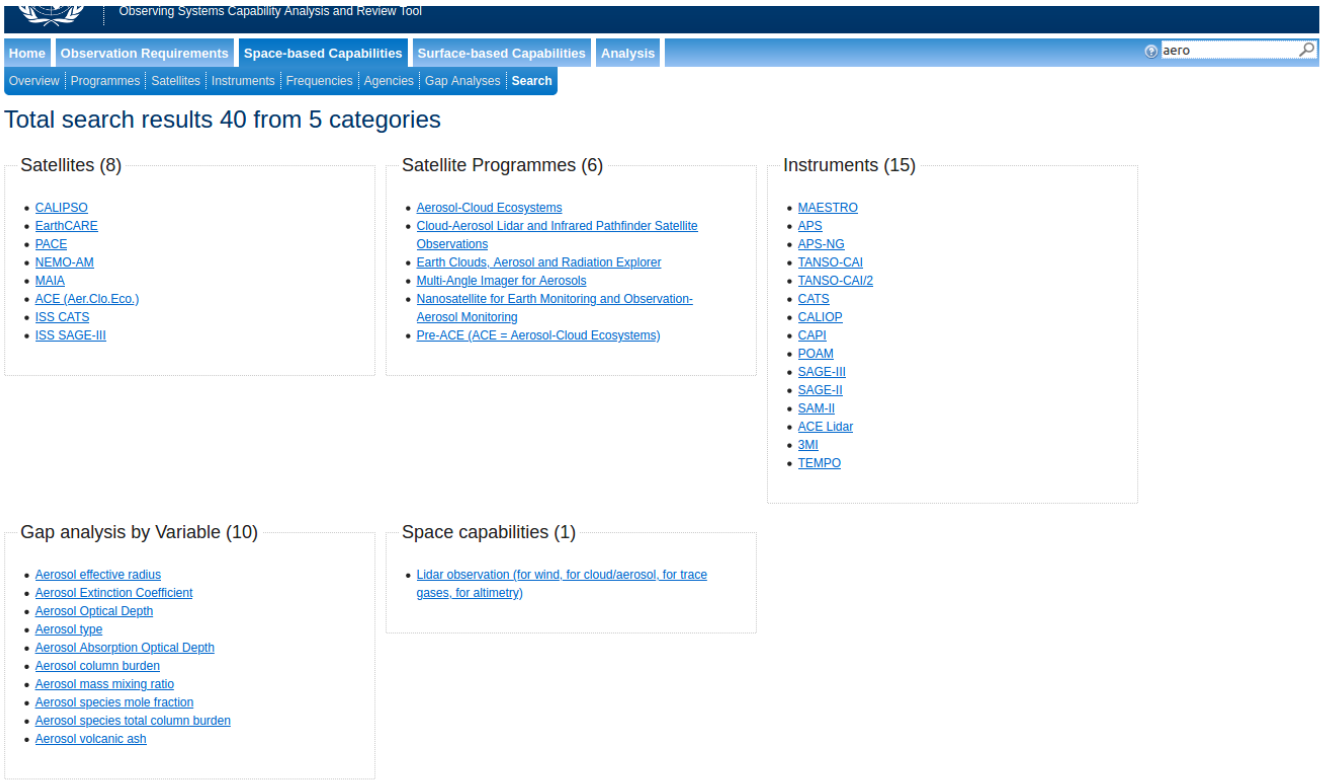


Figure 4: Dedicated search result page (Type 'aero' and press enter)

Note

The "quick search" is **context-sensitive**, which means it only searches through the data items that are part of the currently selected module (e.g. variables, application areas for OSCAR/Requirements; Satellites, Instruments, Space agencies, Variables etc. for OSCAR/Space)

The quick search is not **case-sensitive**, i.e. **Aerosol** and **aerosol** will return the same results.

Working with the full data tables

Another way of accessing the content of OSCAR is by navigating through the submenu of each module of the tool (Figure 5). This option offers tabular access to all available data, i.e. all Variables, Satellites, Instruments, and Application Areas etc. with respective links to more detailed pages.

Figure 5: Space-based capabilities Sub-menu

Filtering

Instead of browsing through the entire table, there is the possibility to use the "**Filter**" option(s) provided for most tables to pre-select items which are of most interest. Figure 6 shows the use of the filter option on the Satellite page.

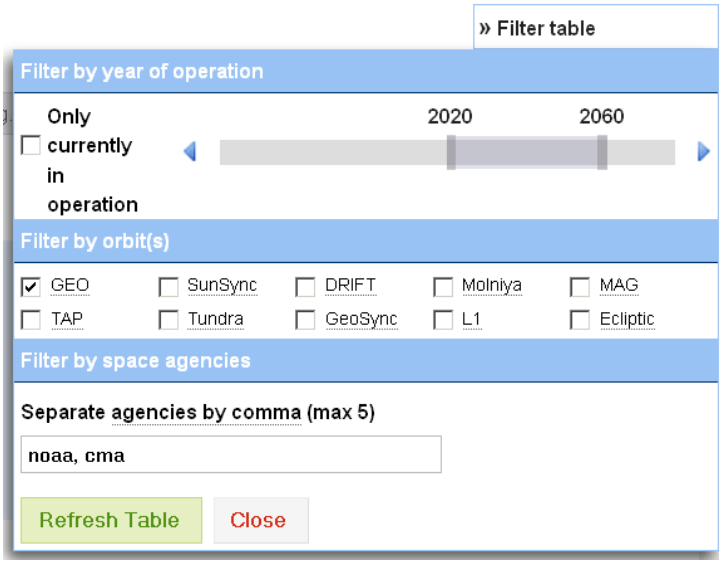


Figure 6: Filter options of the Satellite page

In this example, three types of filters are provided: By year of operation, orbit in which the satellite is flying and by agencies which are involved in the mission. All available filter options can be combined to create complex conditions such as "*Show all currently active Satellites in GEO or Drift Orbit, operated by NOAA or CMA"*

The list of instruments includes expanded filtering possibilities which look slightly different but function along the same lines. In this example the list shows instruments that have the word "ecosystem" anywhere in their name or description, that are operated by either ESA or NASA, and that are a *Passive optical radiometer or spectrometer*.

Note:
Generally, if no item is selected, all are returned.
The **export functionality** takes the current filter into account

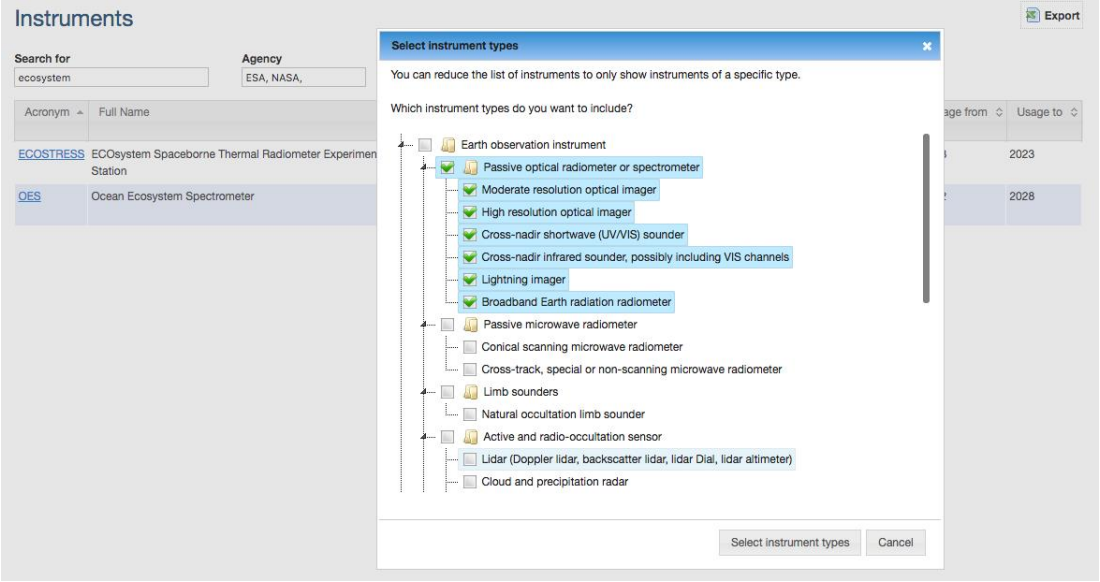


Figure 7: The filtering options for the Instruments.

The instruments can be further filtered by spectral domain, by orbit, by years of operation, and for some instrument types by additional filters (available by clicking the ‘expert search’ button).

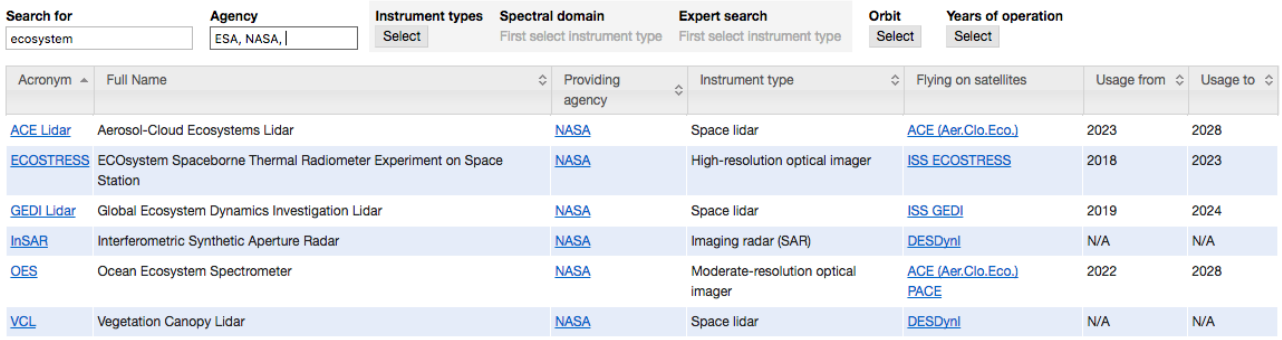


Figure 8: The filtering options for the Instrument detail page.

The spectral domain and expert search filters are applicable to each instrument type separately; therefore, they are only available once the applicable instrument types have been selected.

For example, if a user has selected instrument types “Moderate resolution optical imager” and “Cross-nadir shortwave (UV/VIS) sounder”, then trying to filter by spectral domain would only display those spectral filters that are potentially applicable to these instrument types:

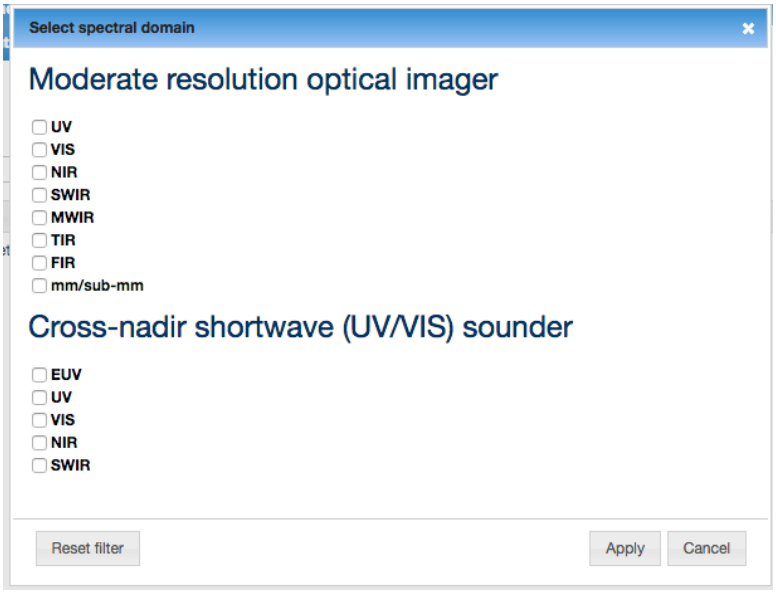


Figure 9: Filtering option for the spectral domain of the Instrument detail page.

The orbit filter is applied across all instrument types. It allows you to limit the instrument list to those instruments that are flying on one or several orbit types, for example, in a Geostationary or Geosynchronous orbit:

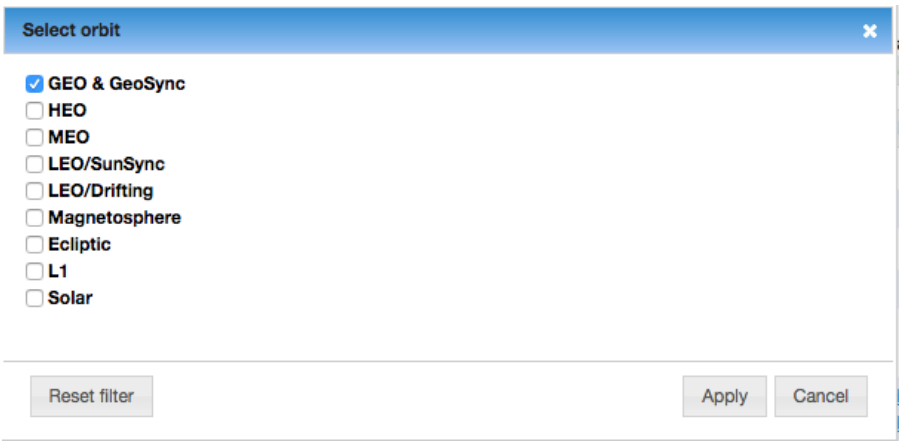


Figure 10: The filtering options for the orbit types.

Finally, the “years of operation” filter allows you to limit the list to instruments flying on a satellite that was active, or is planned to be active during at least part of the selected period.

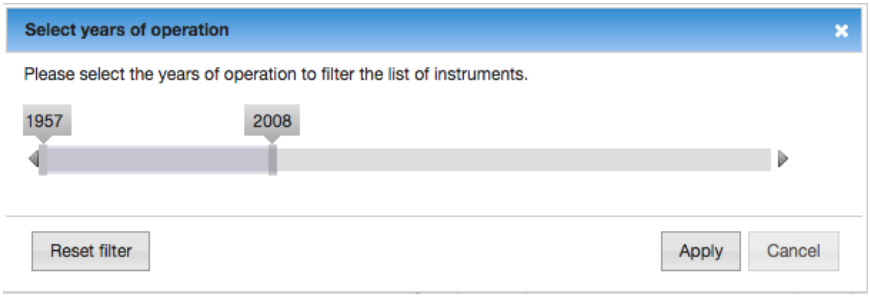


Figure 11: The filtering options for the years of operation of the instruments.

Instead of browsing through the entire table.The list of Frequencies includes expanded filtering with Filter by frequency range, Filter by direction(s), Filter by year of operation, Filter by responsible agency, Filter by service. Figure 12 shows the use of the filter option on the Frequencies page.

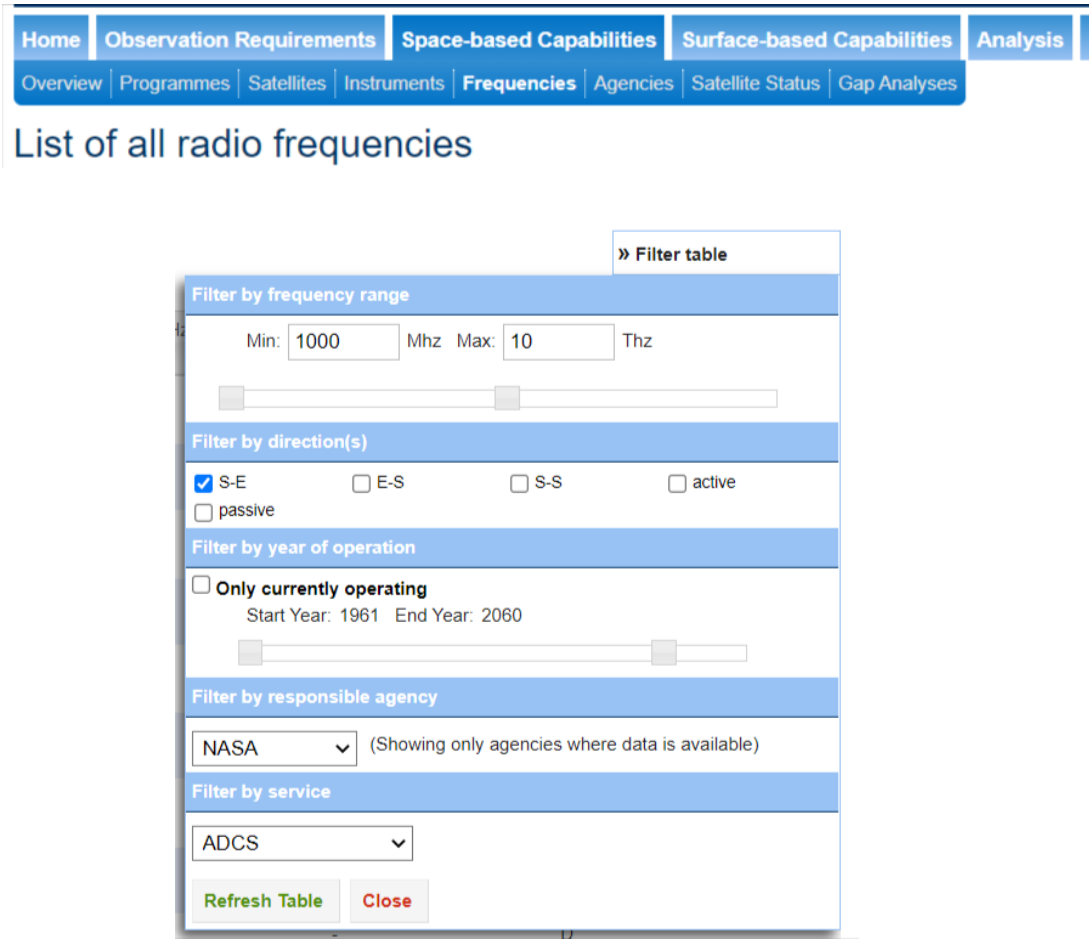


Figure 12: The filtering options of the Frequency page.

In the above example, Five types of filters are provided: Filter by frequency range, Filter by direction(s), Filter by year of operation, Filter by responsible agency, Filter by service. All available filter options can be combined to create complex conditions such as show all frequencies in between 1000 Mhz to 10Thz in S-E direction with year of operation between 1961 to 2060 along with responsible agency is NASA and service provided by ADCS

Sorting

In tables data can be sorted in ascending and descending order where indicated by small arrows, (red circle in Figure 13). Sort direction is changed by clicking on the respective column head.

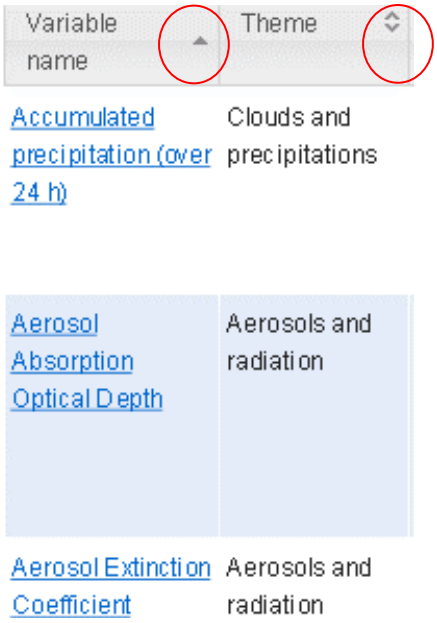


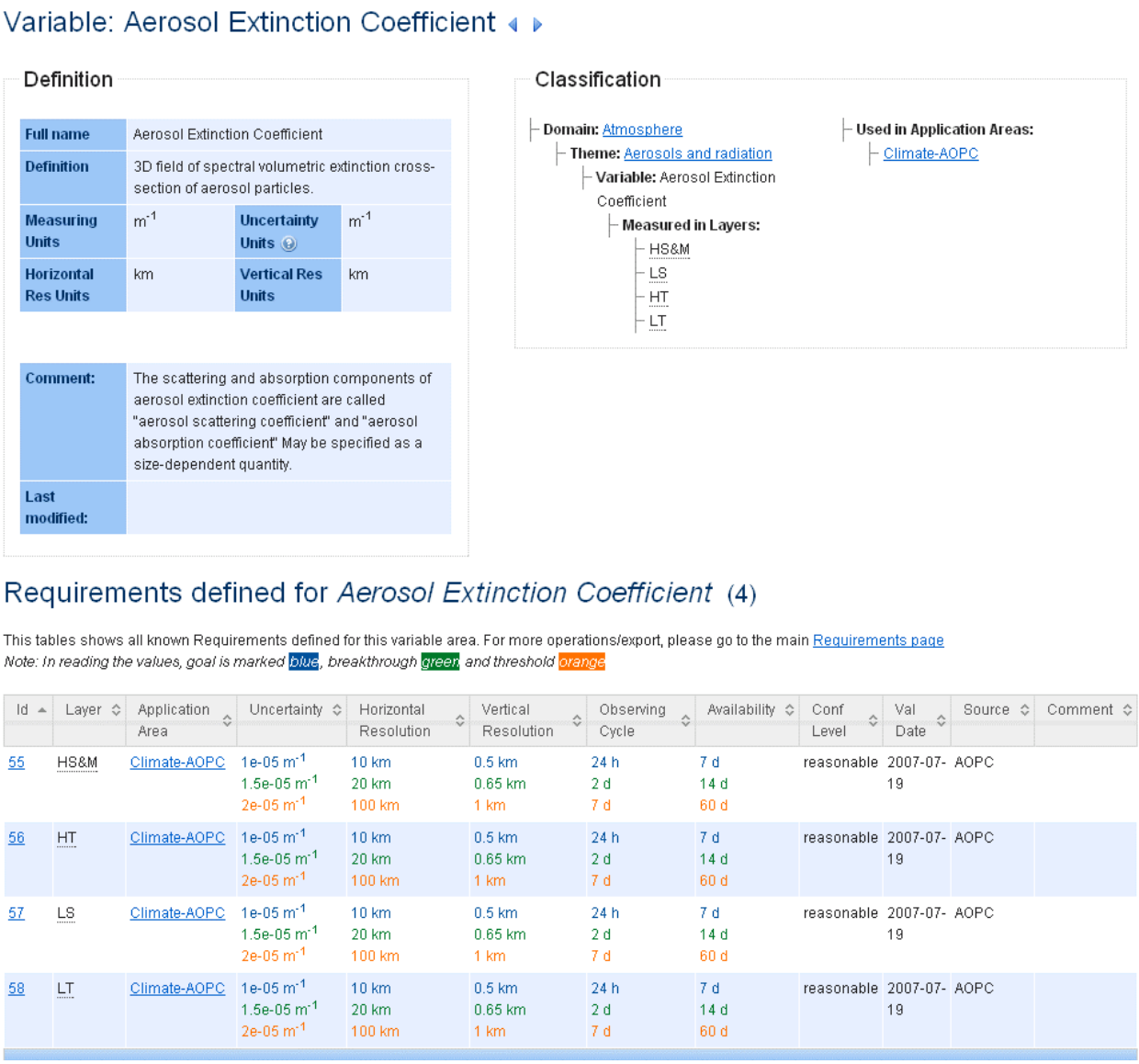
Figure 13: The detailed view of the table with the sorting options of the columns.

Export

All Tables indicated with **Export** (such as Requirements, Variables, Themes, Satellites, Instruments etc.) can be downloaded and saved in .xlsx Format, a native Office 2007 format, which can be read by most other spreadsheet software. These files are automatically generated and thus reflect the current status of the Database. The export function also takes the current filter status into account. Please note that the generation of a large table might take a few seconds.

Detail pages

All data items, such as Variables, Requirements, Instruments or Satellites have their own dedicated detail pages which are accessible through a unique URL (and can thus be bookmarked). These pages can be accessed directly through the quick search, but also from the tables. Detail pages contain all information that is available, e.g. in the case of a satellite, there can be many additional details that are not shown in the overview tables, such as comments on platform status, frequencies used for downlink, payload status, etc.



Variable: Aerosol Extinction Coefficient

Definition

Full name	Aerosol Extinction Coefficient		
Definition	3D field of spectral volumetric extinction cross-section of aerosol particles.		
Measuring Units	m^{-1}	Uncertainty Units	m^{-1}
Horizontal Res Units	km	Vertical Res Units	km
Comment:	The scattering and absorption components of aerosol extinction coefficient are called "aerosol scattering coefficient" and "aerosol absorption coefficient" May be specified as a size-dependent quantity.		
Last modified:			

Classification

- Domain: Atmosphere
  - Theme: Aerosols and radiation
    - Variable: Aerosol Extinction Coefficient
      - Measured in Layers:
        - HS&M
        - LS
        - HT
        - LT
- Used in Application Areas:
  - Climate-AOPC

Requirements defined for *Aerosol Extinction Coefficient* (4)

This tables shows all known Requirements defined for this variable area. For more operations/export, please go to the main Requirements page

Note: In reading the values, goal is marked blue, breakthrough green, and threshold orange

Id	Layer	Application Area	Uncertainty	Horizontal Resolution	Vertical Resolution	Observing Cycle	Availability	Conf Level	Val Date	Source	Comment
55	HS&M	Climate-AOPC	1e-05 m^{-1} 1.5e-05 m^{-1} 2e-05 m^{-1}	10 km 20 km 100 km	0.5 km 0.65 km 1 km	24 h 2 d 7 d	7 d 14 d 60 d	reasonable	2007-07-19	AOPC	
56	HT	Climate-AOPC	1e-05 m^{-1} 1.5e-05 m^{-1} 2e-05 m^{-1}	10 km 20 km 100 km	0.5 km 0.65 km 1 km	24 h 2 d 7 d	7 d 14 d 60 d	reasonable	2007-07-19	AOPC	
57	LS	Climate-AOPC	1e-05 m^{-1} 1.5e-05 m^{-1} 2e-05 m^{-1}	10 km 20 km 100 km	0.5 km 0.65 km 1 km	24 h 2 d 7 d	7 d 14 d 60 d	reasonable	2007-07-19	AOPC	
58	LT	Climate-AOPC	1e-05 m^{-1} 1.5e-05 m^{-1} 2e-05 m^{-1}	10 km 20 km 100 km	0.5 km 0.65 km 1 km	24 h 2 d 7 d	7 d 14 d 60 d	reasonable	2007-07-19	AOPC	

Figure 14: Detail page: All information on the specific variable.

Instruments

In addition to a technical description, the Instruments page contains the indication of the satellites carrying the instruments, the main measurement objectives the instrument has been designed for, and a tentative evaluation of the performance of these measurements according to an expert system, which is the basis for the Gap Analysis described below. Only the first five primary mission objectives are displayed on the standard view, the full list can be seen by clicking on “Show all”. The tentative evaluation of measurements also indicates possible “operational limitations” and a line of explanation. The list of measurements can be filtered, for example Figure 15 shows the evaluation of measurements from MLS(Aura) filtered by the word “Ozone”.

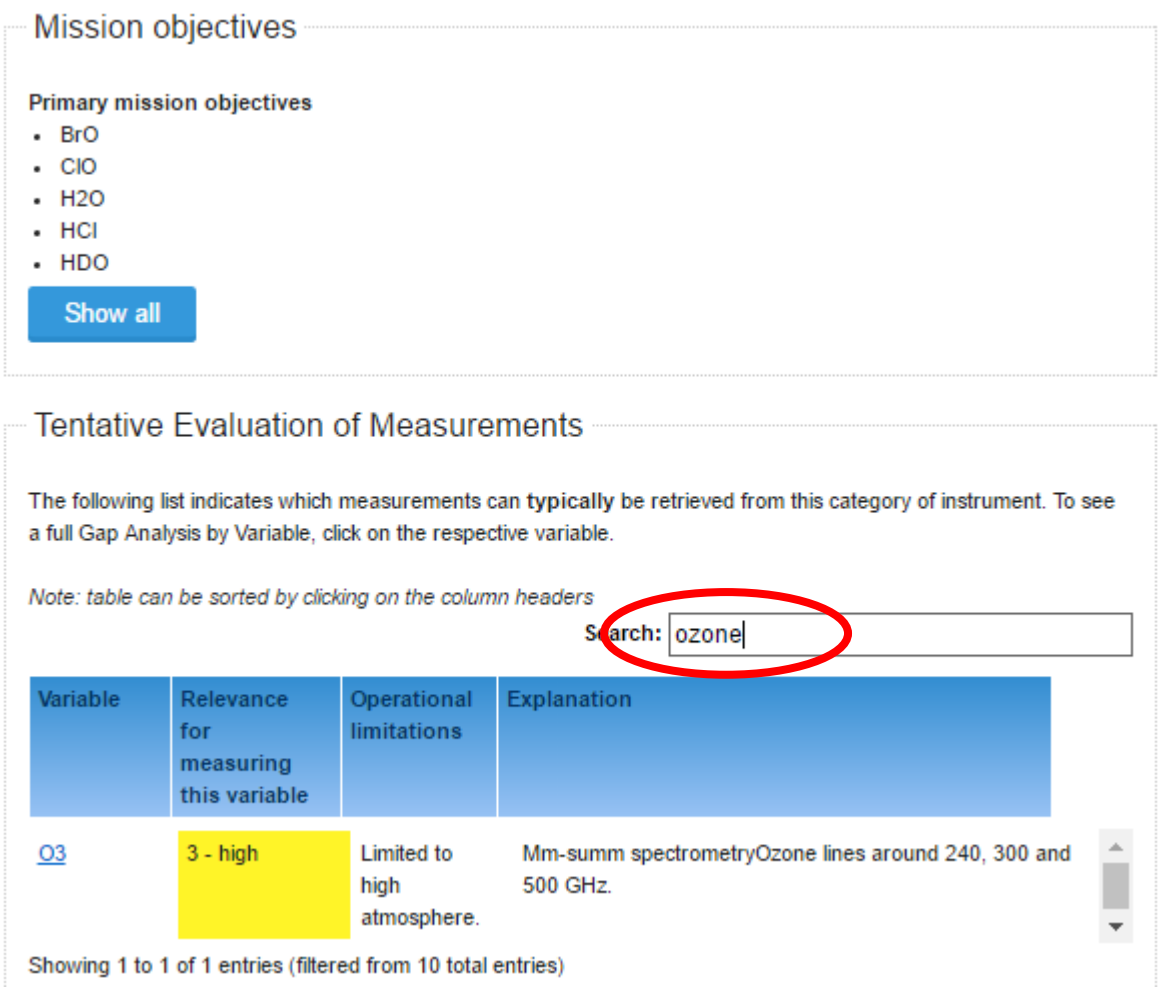


Figure 15: **Tentative evaluation of measurements from MLS (Aura) filtered by the word "ozone".**

The detailed status of an instrument flying on a particular satellite can be shown, when this information is available, by clicking on "See instrument status" after the name of the satellite on the upper-right part of the Instrument page.

Frequencies

The Frequencies table aims to provide a directory of radio-frequencies used on each satellite platform, including the telecommunication frequencies (uplink/downlink) and the microwave remote-sensing frequencies (active or passive). This list is not exhaustive but focuses on operational satellites. The same information is available on the Satellite pages, in a summary form on the standard view, and with full details when selecting "Show expert details".

Expert analysis tools

The OSCAR Space-based capabilities module also serves as a first level analysis tool providing expert assessments on the availability and relevance of the various instruments to fulfil particular missions, or for measuring particular variables. This should however only be seen as a starting point for more detailed, specific studies. These assessments are considering the potential performance of instruments, primarily on the basis of their design features, and do not take into account other important criteria such as accuracy of instrument calibration or actual data availability or timeliness.

Four kinds of Gap analyses are currently provided: by variable based on expert rules, by variable based on a simplified approach, by type of mission on ECT range or on Orbit types or on Longitude range, and by WIGOS subcomponent with instrument filter selection as per the subcomponent along with ECT range or on Orbit types or on Longitude range.

Gap Analyses by Variables (expert rules)

The Gap Analysis by Variable relies on a rule-based expert system to determine whether and to what degree an instrument has the potential to measure a particular geophysical variable. This tool can be used to draw measurement timelines by specific Variables, by selecting a sub-domain (e.g. Cloud and precipitation Land surface, Ocean) and the particular variable. For example, a rule can say that *Moderate resolution optical imagers* with more than 2 VIS channels and more than 2 different viewing angles are the primary instruments for measuring the *Earth Surface Albedo*. The OSCAR/Space knowledge basis contains over 2500 built-in rules to determine how a particular instrument (among nearly 1,000 recorded instruments) is suited to measure a given variable (among more than 160 variables measurable from space), according to its main technical specifications. The resulting data (Figure 17) can be sorted by clicking on the header columns (e.g. satellite, instrument, year, etc). Filtering by satellite or instrument is also possible.

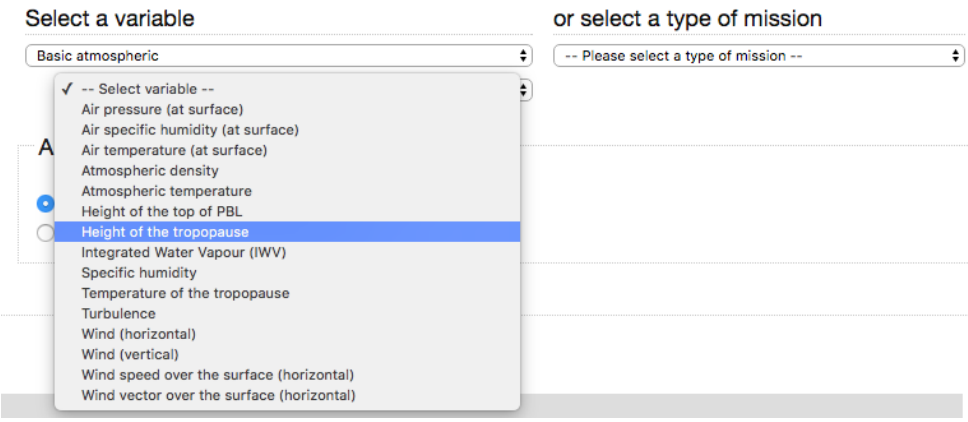


Figure 16: Selecting a sub-domain and a Variable for Gap Analysis

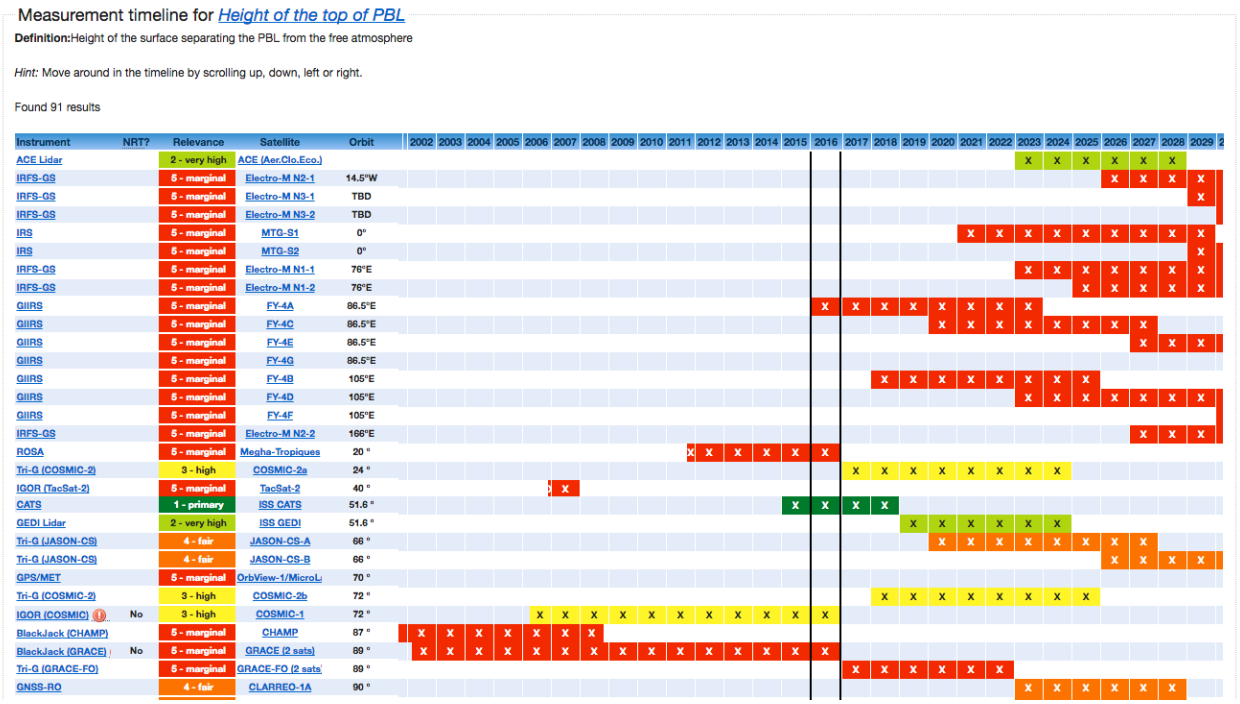


Figure 17: Result of a Gap Analysis

> **Note:** Instruments to fly on satellites which are not firmly planned are shaded with stripes in the table. The current year is highlighted with black bars. It is possible to sort the Gap Analysis table by clicking on any of the cells in the table header. A warning icon () indicates a degraded satellite. Hover over the icon or select the satellite to see details on the type of degradation

Variable filters shall have Instrument types, ECT range, Orbit types & Longitude range. The filter will work in “And” condition where All available filter options can be combined to create complex conditions. as shown in figure 18

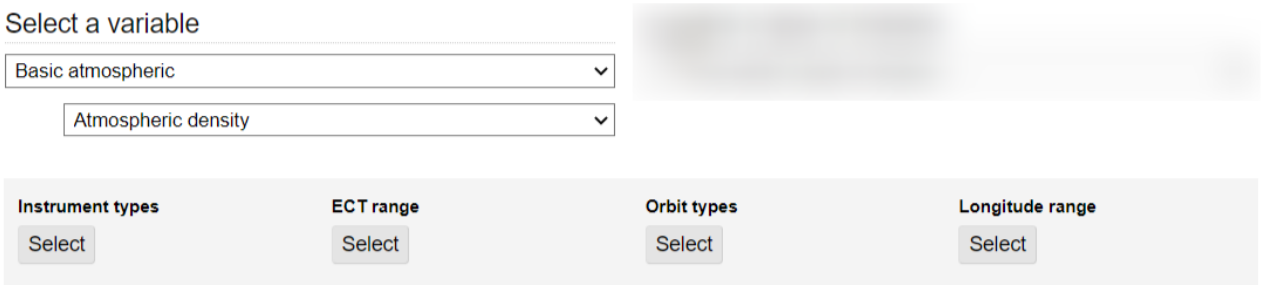


Figure 18: The filters for the variables in the Gap Analysis.

In figure 19, there are two more filters for instrument.

Hide lower rated instruments: This will hide all instruments having greater than 3 relevance and will show only those instruments which have less or equal 3 relevance.

Hide inactive instruments: This will hide all instruments whose satellite instrument status is 'N/A' or 'degraded' or 'inactive'.

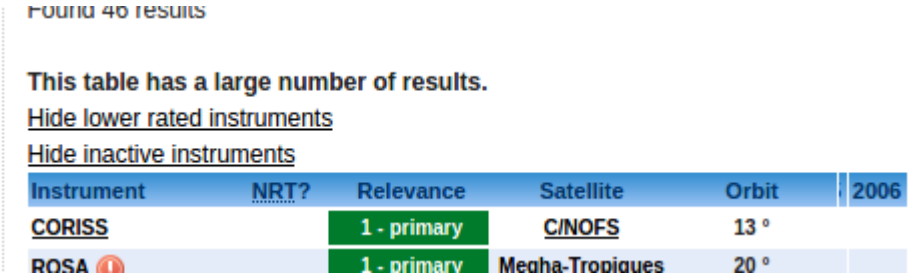


Figure 19: Show/Hide inactive/low rated Instrument for variables of a Gap Analysis and for mission type Gap Analysis

Instrument filters are available for gap analysis by variable only. This will allow to filter gap analysis by instrument types. By Clicking on the 'Select' button on the above image will open a popup with all instrument types for selection.

Sorting Criteria:

Sorting criteria has been introduced in version 2.5. New field added in add/edit variable form which is free text. This sorting criteria is reflected in GapAnalysis by Variable based on selected variable. If sorting criteria is added for selected variable then it will show 'Show sorting criteria' toggle button to show/hide sorting criteria as per below Figure 20.

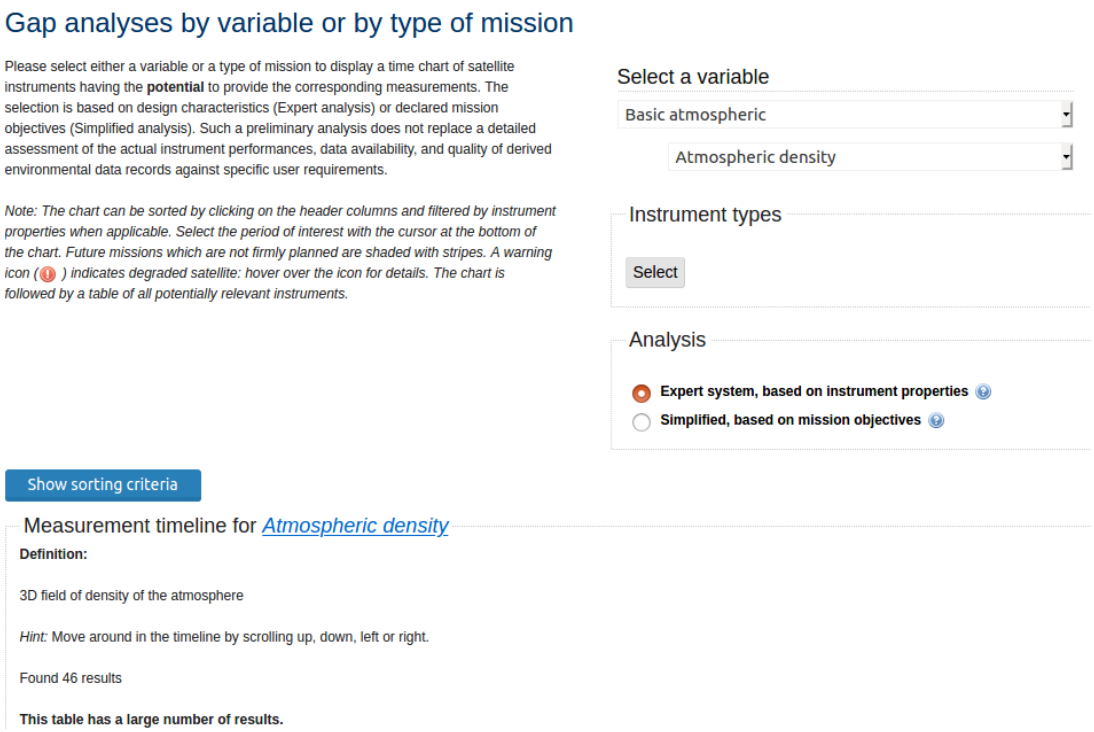


Figure 20: Sorting criteria for Gap analysis by variable.

Gap Analyses by Variables (simplified analysis)

In the “Simplified” mode, the results are calculated by looking at each instrument's mission objectives: for each instrument we keep track of what the primary, secondary, and opportunity mission objectives are. These mission objectives indicate respectively that an instrument is primarily designed to measure variable X, Y and Z, that variables A, B and C are its secondary objectives, and that it may offer the opportunity to measure variables I and II although it is not optimized for that. The simplified Gap analysis produces a timeline based on this information. The simplified Gap analysis considers the relative priorities of measuring certain variables in the design and exploitation of a particular instrument, while the expert approach analyses the objective characteristics of all instruments of the relevant type.

Gap analyses by type of mission

This tool is specifically designed to support WMO Members in monitoring the implementation of the space-based observing system and planning its further evolution. It refers to a predetermined list of capabilities such as those identified in the WMO Vision of Global Observing Systems for 2025. Unlike the gap analysis by variable, the gap analysis by mission is technology-oriented. The instruments are sorted in up to five categories, according to the technology used. The sorting criteria of each mission are displayed when clicking on the relevant box (“Show sorting criteria").

To see instruments contributing to a particular capability, one can select that capability in the same screen as the Gap Analysis. However, instead of selecting a variable, you select a *mission* from the second dropdown menu. The resulting timeline functions in a similar way to how the Gap Analysis works. In addition, a block “Additional filters” appears. This block allows drilling down the analysis in limiting the display to specific spectral bands, among the bands that are applicable to at least one instrument in the list.

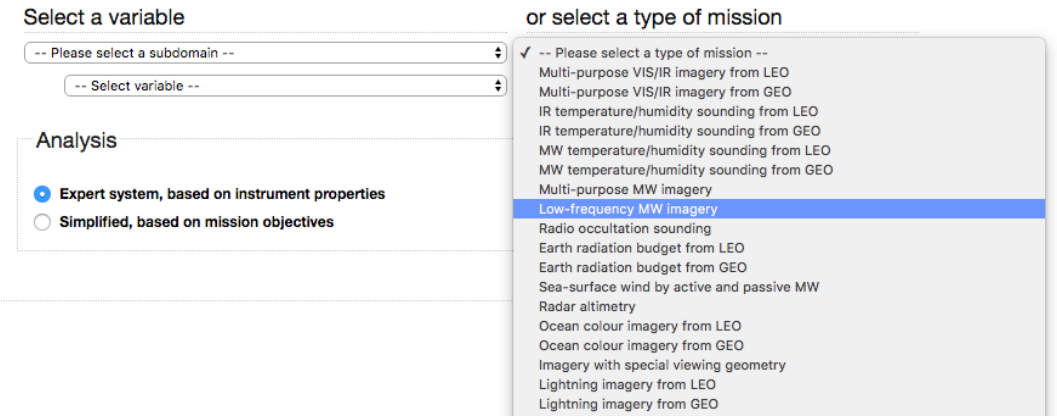


Figure 21: Selecting a mission for the capability review (in the Gap analysis screen).

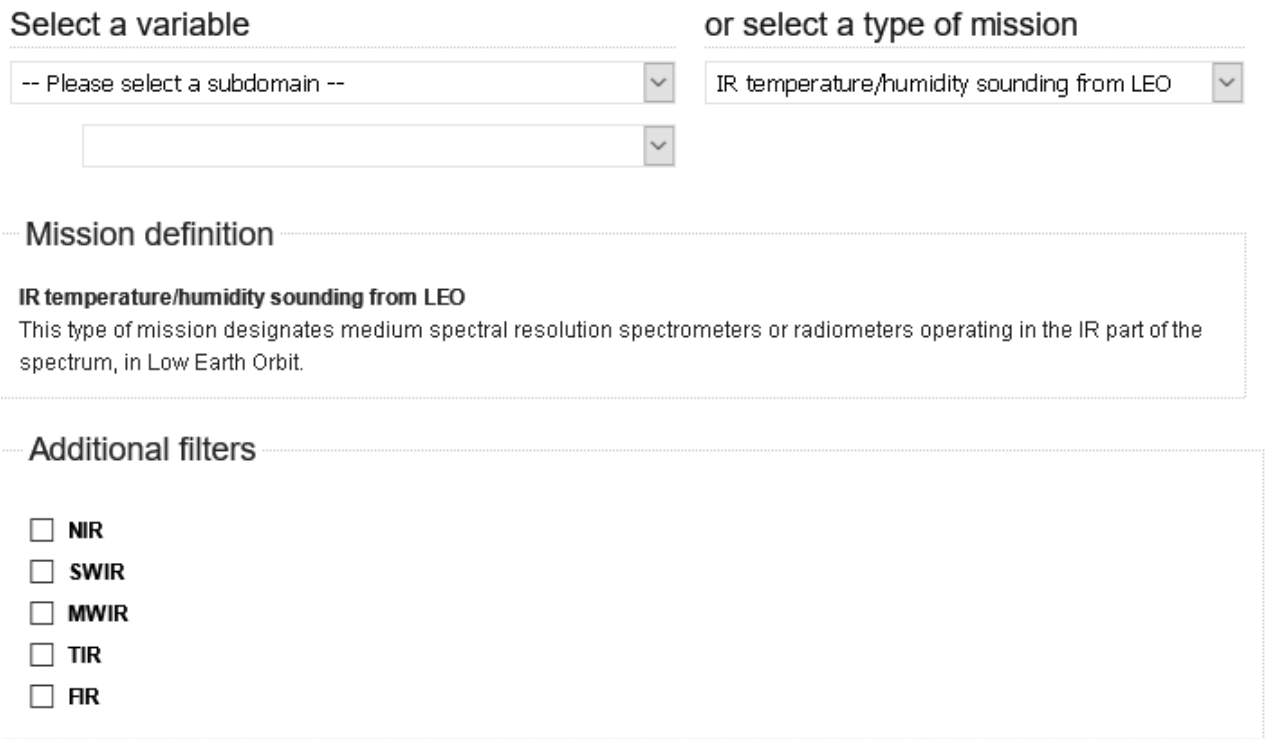


Figure 22: The additional filters for the type of mission in Gap Analysis.

Additional filter is available for ‘Select a type of mission’ only. Additional filter will allow to filter gap analysis

Gap Analyses by select WIGOS subcomponents

Gap analysis by WIGOS subcomponent the result will be calculated by selecting each WIGOS subcomponent individually or multiple. Listing of instrument filters will be visible which are tagged with WIGOS subcomponents. The filters will work in “And” condition where multiple WIGOS subcomponents and their instrument filters can be selected. As shown in figure 23

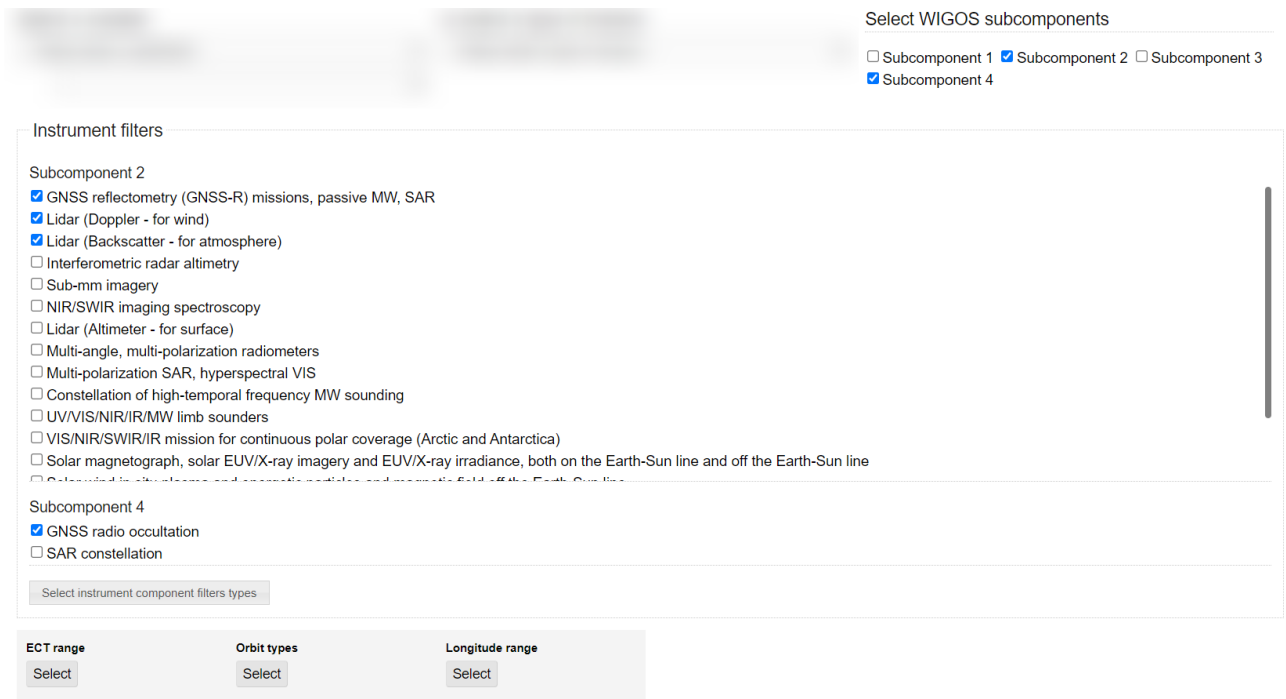


Figure 23: Additional filter for type of mission of a Gap Analysis.

Additional filters that are used as per the selection

Four additional sub filters that can be enabled as per the selection: Instrument types, ECT range, Orbit types & Longitude range. As shown in figure 24

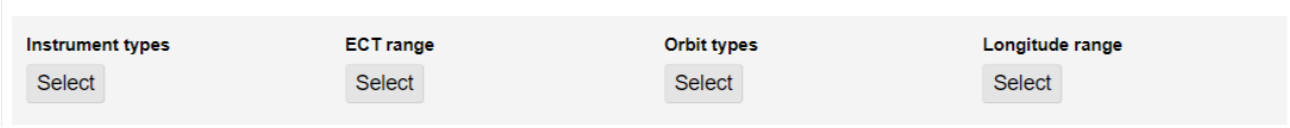


Figure 24: Additional filter for type of mission of a Gap Analysis.

Instrument type:

This filter shall be used to filter the instruments of specific type. Instrument type filter shall be available for the Gap Analysis of any Variable. As shown in figure 25

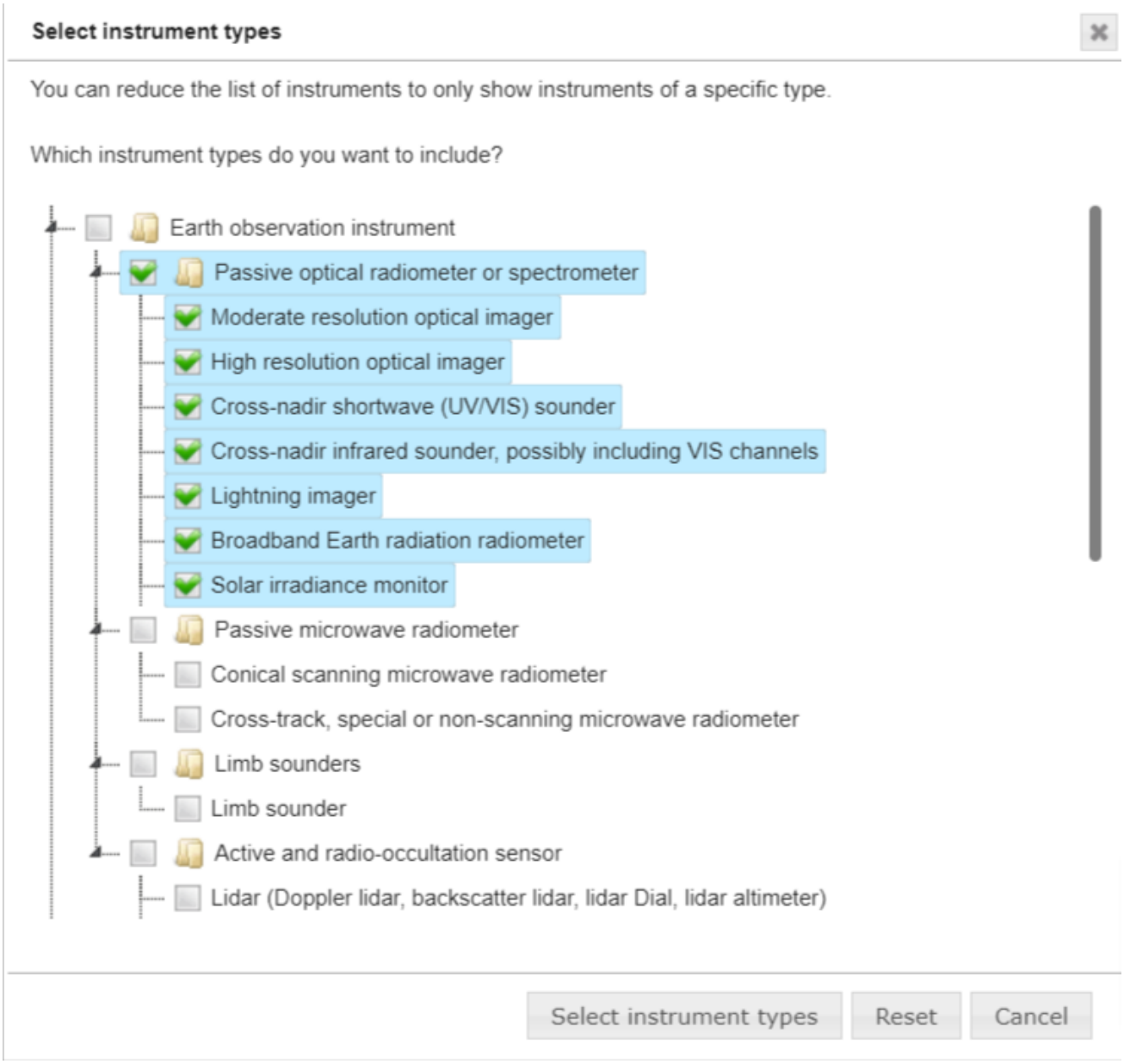


Figure 25: Instrument filter additional filter of a Gap Analysis.

ECT Range:

This filter shall be available for the Gap Analysis of any Variable, Mission or WIGOS Subcomponents. When the filter is applied the Gap Analysis result shall be presented only for the satellites on Sun-synchronous orbit according to filter selection and its recorded ECT time. As shown in figure 26

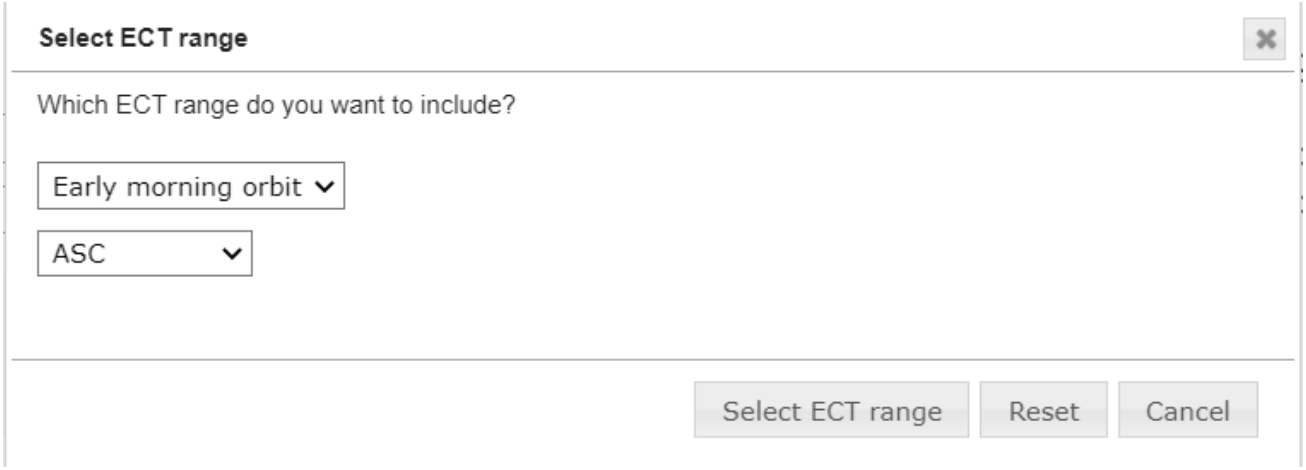


Figure 26: ECT range additional filter of a Gap Analysis.

Orbit Types:

When one or more orbit types are selected, Gap Analysis results shall be filtered according to the orbit information of the instrument and the satellite. As shown in figure 27

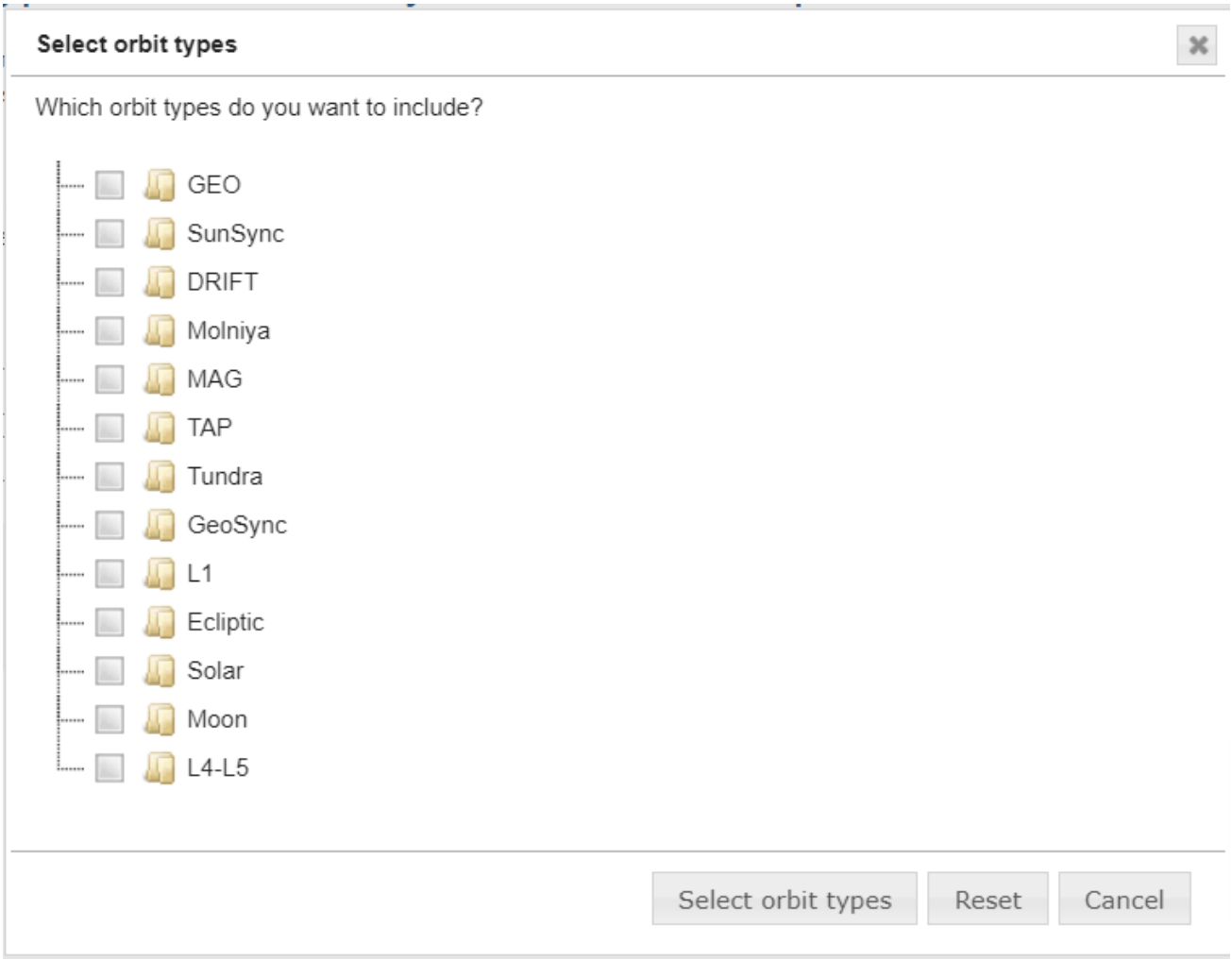


Figure 27: Orbit type additional filter of a Gap Analysis.

Longitude range:

This filter shall be available for any OSCAR/Space Gap Analysis (variables, missions and WIGOS subcomponent). When the filter is applied, the results will be shown only GEO instruments in the Gap Analysis. As shown in Figure 28

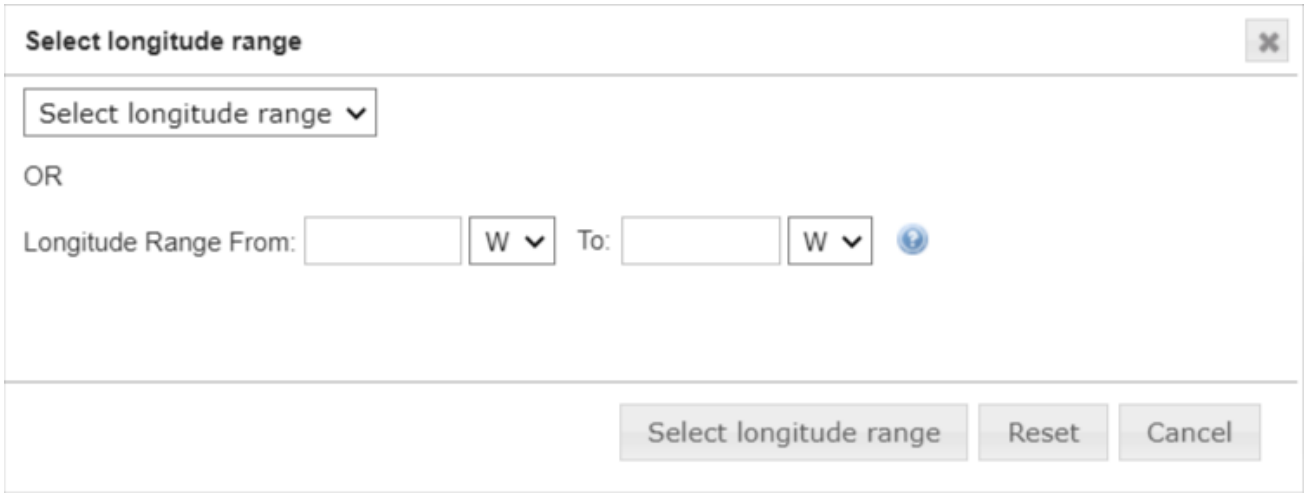
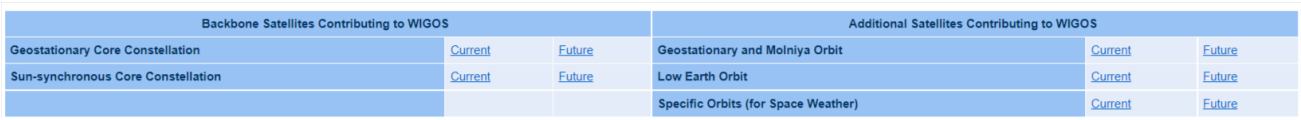


Figure 28: Longitude range additional filter of a Gap Analysis

Satellite status page

This page lists the status of current and future satellites. Selecting any current or future of any satellite it will redirect to the information of that satellite on the same page. As shown in Figure 29



Backbone Satellites Contributing to WIGOS			Additional Satellites Contributing to WIGOS		
Geostationary Core Constellation	Current	Future	Geostationary and Molniya Orbit	Current	Future
Sun-synchronous Core Constellation	Current	Future	Low Earth Orbit	Current	Future
			Specific Orbits (for Space Weather)	Current	Future

Figure 29: Satellite status page.

In the below example once click on “current” in “specific orbit (for space weather)”. Page will redirect on the same page on the selected section. All the hyperlinks are clickable and will be redirected to their specific detail page. As shown in Figure 30.

Current Specific Orbits (for Space Weather)

Name	Operator(s)	Orbit	Launch	Instruments	Details
ACE	NASA, NOAA	L1	25 Aug 1997	SWIMS, SWICS, ULEIS, SEPICA , SWEPAM, MAG, SIS, CRIS, EPAM	• Data available from the Space Radiation Laboratory of Caltech, Pasadena, CA.
SOHO	ESA, NASA	L1	02 Dec 1995	SUMER, CDS, EIT, UVCS, LASCO, SWAN, CELIAS, COSTEP, ERNE, GOLF, VIRGO , MDI, SEM	• Data available from NASA/GSFC and ESA/ESAC.
WIND	NASA	L1	01 Nov 1994	MFI, WAVES, SWE, SMS, EPACT, PLASMA, TGRS, KONUS	• Data available from NASA/GSFC.
Solar Orbiter	ESA, NASA	Solar	10 Feb 2020	EPD, EUI, METIS, MAG, RPW, SWA, PHI, SoloHI, SPICE, STIX	• Data available from the European Space Astronomy Centre (ESAC), Villafranca.
STEREO-A	NASA	Ecliptic	26 Oct 2006	PLASTIC, S/WAVES, IMPACT/STE, IMPACT/SWEA, SECCHI/COR-1, SECCHI/COR-2, SECCHI/HI-1, SECCHI/HI-2, IMPACT/SEP, IMPACT/MAG, SECCHI/EUVI	• Data available from NASA/GSFC.
DSCOVR	NOAA, NASA	L1	11 Feb 2015	NISTAR, EPIC, MAG, ES, FC	• Data exchanged within the International Real Time Solar Wind Network (RTSWnet). • Data archived at the NOAA National Geophysical Data Center, Boulder, Co.

Figure 30: Current specific orbit of the satellite status page

A restful API to deliver JSON OSCAR/Space and WIGOS XML records

A restful API from discovering and retrieving WIGOS records in XML format for Satellite (LEO & GEO) endpoint and extending the API to deliver JSON records for Instrument, Variable & Satellite endpoints.

A restful API to deliver JSON OSCAR/Space records

REST APIs to deliver JSON for Instrument, Variable & Satellite records from OSCAR/Space. API will be full paginated content. Also API has pagination links First, Prev, Self, Next and Last. Pagination will be placed under "_links". API link also provides page size, totalElements, totalPages and number under "page" element. Please refer to the endpoints links.

Swagger: https://space.oscar.wmo.int/oscar/swagger/index.html

End Point 1 - Instrument: https://space.oscar.wmo.int/oscar/api/v1/instruments

Example:

instruments": [
{
"id": "3mi",
"acronym": "3MI",
"fullname": "Multi-viewing Multi-channel Multi-polarisation Imager",
"providing-agency": "ESA",
"instrumenttype": "Moderate-resolution optical imager",
"classification": [

```
  "Earth observation instrument",
  "Passive optical radiometer or spectrometer",
  "Moderate resolution optical imager"
 ],
 "wigos-subcomponent": {
  "1": {
   "name": "Subcomponent 1",
   "wigos-classification": [
    "Multi-spectral VIS/IR imagery with rapid repeat cycles [in GEO]",
    "IR hyperspectral sounders [in GEO]",
    "Lightning mappers [in GEO]",
    "MW sounders [in SSO]"
   ]
  }
 },
 "instrument-satellites": [
  {
   "start-date": null,
   "EoL": null,
   "satellites": {
    "id": "acrimsat",
    "name": "Active Cavity Radiometer Irradiance Monitor Satellite",
    "_links": {
     "self": {
      "href": "http://space.oscar.wmo.int/oscar/api/v1/satellites/acrimsat"
     }
    }
   }
  },
  {
   "start-date": null,
   "EoL": null,
   "satellites": {
    "id": "gosat",
    "name": "Green-house gas Observing Satellite",
    "_links": {
     "self": {
```

```
        "href": "http://space.oscar.wmo.int/oscar/api/v1/satellites/gosat"
       }
     }
   }
 },
 {
  "start-date": null,
  "EoL": null,
  "satellites": {
   "id": "mtg_i1",
   "name": "Meteosat Third Generation - Imaging 1",
   "_links": {
    "self": {
     "href": "http://space.oscar.wmo.int/oscar/api/v1/satellites/mtg_i1"
    }
   }
  }
 },
 {
  "start-date": "≥2030",
  "EoL": "≥2037",
  "satellites": {
   "id": "metop_sg_a2",
   "name": "Meteorological operational satellite Second Generation A2 ",
   "_links": {
    "self": {
     "href": "http://space.oscar.wmo.int/oscar/api/v1/satellites/metop_sg_a2"
    }
   }
  }
 },
 {
  "start-date": "≥2037",
  "EoL": "≥2044",
  "satellites": {
   "id": "metop_sg_a3",
   "name": "Meteorological operational satellite Second Generation A3",
```

```
      "_links": {
        "self": {
          "href": "http://space.oscar.wmo.int/oscar/api/v1/satellites/metop_sg_a3"
        }
      }
    }
  },
  {
    "start-date": "≥2023",
    "EoL": "≥2030",
    "satellites": {
      "id": "metop_sg_a1",
      "name": "Meteorological operational satellite Second Generation A1",
      "_links": {
        "self": {
          "href": "http://space.oscar.wmo.int/oscar/api/v1/satellites/metop_sg_a1"
        }
      }
    }
  },
  {
    "start-date": null,
    "EoL": null,
    "satellites": {
      "id": "hj_2a",
      "name": "Huan Jing 2A",
      "_links": {
        "self": {
          "href": "http://space.oscar.wmo.int/oscar/api/v1/satellites/hj_2a"
        }
      }
    }
  }
],
"variables": [
  {
    "relevancy": "1 - primary",
```

```
  "variable": {
    "id": "aerosol_column_burden",
    "name": "Aerosol column burden",
    "_links": {
      "self": {
        "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/aerosol_column_burden"
      }
    }
  }
},
{
  "relevancy": "1 - primary",
  "variable": {
    "id": "aerosol_effective_radius",
    "name": "Aerosol effective radius",
    "_links": {
      "self": {
        "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/aerosol_effective_radius"
      }
    }
  }
},
{
  "relevancy": "1 - primary",
  "variable": {
    "id": "aerosol_mass_mixing_ratio",
    "name": "Aerosol mass mixing ratio",
    "_links": {
      "self": {
        "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/aerosol_mass_mixing_ratio"
      }
    }
  }
},
{
  "relevancy": "1 - primary",
  "variable": {
```

```
    "id": "aerosol_optical_depth",
    "name": "Aerosol Optical Depth",
    "_links": {
      "self": {
        "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/aerosol_optical_depth"
      }
    }
  }
},
{
  "relevancy": "1 - primary",
  "variable": {
    "id": "aerosol_type",
    "name": "Aerosol type",
    "_links": {
      "self": {
        "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/aerosol_type"
      }
    }
  }
},
{
  "relevancy": "1 - primary",
  "variable": {
    "id": "earth_surface_albedo",
    "name": "Earth surface albedo",
    "_links": {
      "self": {
        "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/earth_surface_albedo"
      }
    }
  }
},
{
  "relevancy": "1 - primary",
  "variable": {
    "id": "earth_surface_short_wave_bidirectional_reflectance",
```

```
      "name": "Earth surface short-wave bidirectional reflectance",
      "_links": {
       "self": {
        "href":
"http://space.oscar.wmo.int/oscar/api/v1/variables/earth_surface_short_wave_bidirectional_reflectance"
       }
      }
     }
    },
    {
     "relevancy": "1 - primary",
     "variable": {
      "id": "fraction_of_absorbed_par_fapar",
      "name": "Fraction of Absorbed PAR (FAPAR)",
      "_links": {
       "self": {
        "href":
"http://space.oscar.wmo.int/oscar/api/v1/variables/fraction_of_absorbed_par_fapar"
       }
      }
     }
    },
    {
     "relevancy": "1 - primary",
     "variable": {
      "id": "photosynthetically_active_radiation_par",
      "name": "Photosynthetically Active Radiation (PAR)",
      "_links": {
       "self": {
        "href":
"http://space.oscar.wmo.int/oscar/api/v1/variables/photosynthetically_active_radiation_par"
       }
      }
     }
    },
    {
```

```
      "relevancy": "1 - primary",
      "variable": {
        "id": "short_wave_cloud_reflectance",
        "name": "Short-wave cloud reflectance",
        "_links": {
          "self": {
            "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/short_wave_cloud_reflectance"
          }
        }
      }
    },
    {
      "relevancy": "1 - primary",
      "variable": {
        "id": "aerosol_volcanic_ash",
        "name": "Aerosol volcanic ash",
        "_links": {
          "self": {
            "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/aerosol_volcanic_ash"
          }
        }
      }
    },
    {
      "relevancy": "1 - primary",
      "variable": {
        "id": "aerosol_volcanic_ash_total_column",
        "name": "Aerosol volcanic ash  Total Column",
        "_links": {
          "self": {
            "href":
"http://space.oscar.wmo.int/oscar/api/v1/variables/aerosol_volcanic_ash_total_column"
          }
        }
      }
    },
    {
```

```
  "relevancy": "2 - very high",
  "variable": {
    "id": "cloud_optical_depth",
    "name": "Cloud optical depth",
    "_links": {
      "self": {
        "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/cloud_optical_depth"
      }
    }
  }
},
{
  "relevancy": "2.1 - very high",
  "variable": {
    "id": "snow_cover",
    "name": "Snow cover",
    "_links": {
      "self": {
        "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/snow_cover"
      }
    }
  }
},
{
  "relevancy": "2.3 - very high",
  "variable": {
    "id": "leaf_area_index_lai",
    "name": "Leaf Area Index (LAI)",
    "_links": {
      "self": {
        "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/leaf_area_index_lai"
      }
    }
  }
},
{
  "relevancy": "3 - high",
```

```
      "variable": {
        "id": "oil_spill_cover",
        "name": "Oil spill cover",
        "_links": {
          "self": {
            "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/oil_spill_cover"
          }
        }
      }
    },
    {
      "relevancy": "3.1 - high",
      "variable": {
        "id": "downward_short_wave_irradiance_at_earth_surface",
        "name": "Downward short-wave irradiance at Earth surface",
        "_links": {
          "self": {
            "href":
"http://space.oscar.wmo.int/oscar/api/v1/variables/downward_short_wave_irradiance_at_earth_surf
ace"
          }
        }
      }
    },
    {
      "relevancy": "3.1 - high",
      "variable": {
        "id": "normalised_difference_vegetation_index_ndvi",
        "name": "Normalised Difference Vegetation Index (NDVI)",
        "_links": {
          "self": {
            "href":
"http://space.oscar.wmo.int/oscar/api/v1/variables/normalised_difference_vegetation_index_ndvi"
          }
        }
      }
    },
```

```
    {
      "relevancy": "3.5 - high",
      "variable": {
        "id": "upward_short_wave_irradiance_at_toa",
        "name": "Upward short-wave irradiance at TOA",
        "_links": {
          "self": {
            "href":
"http://space.oscar.wmo.int/oscar/api/v1/variables/upward_short_wave_irradiance_at_toa"
          }
        }
      }
    },
    {
      "relevancy": "4 - fair",
      "variable": {
        "id": "cloud_drop_effective_radius",
        "name": "Cloud drop effective radius",
        "_links": {
          "self": {
            "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/cloud_drop_effective_radius"
          }
        }
      }
    },
    {
      "relevancy": "4 - fair",
      "variable": {
        "id": "cloud_ice_effective_radius",
        "name": "Cloud ice effective radius",
        "_links": {
          "self": {
            "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/cloud_ice_effective_radius"
          }
        }
      }
    },
```

```
{
  "relevancy": "4.1 - fair",
  "variable": {
    "id": "sea_ice_cover",
    "name": "Sea-ice cover",
    "_links": {
      "self": {
        "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/sea_ice_cover"
      }
    }
  }
},
{
  "relevancy": "4.3 - fair",
  "variable": {
    "id": "biomass",
    "name": "Biomass",
    "_links": {
      "self": {
        "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/biomass"
      }
    }
  }
},
{
  "relevancy": "5 - marginal",
  "variable": {
    "id": "cloud_type",
    "name": "Cloud type",
    "_links": {
      "self": {
        "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/cloud_type"
      }
    }
  }
},
{
```

```
      "relevancy": "5 - marginal",
      "variable": {
        "id": "colour_dissolved_organic_matter_cdom",
        "name": "Colour Dissolved Organic Matter (CDOM)",
        "_links": {
          "self": {
            "href":
"http://space.oscar.wmo.int/oscar/api/v1/variables/colour_dissolved_organic_matter_cdom"
          }
        }
      }
    },
    {
      "relevancy": "5 - marginal",
      "variable": {
        "id": "ocean_chlorophyll_concentration",
        "name": "Ocean chlorophyll concentration ",
        "_links": {
          "self": {
            "href":
"http://space.oscar.wmo.int/oscar/api/v1/variables/ocean_chlorophyll_concentration"
          }
        }
      }
    },
    {
      "relevancy": "5 - marginal",
      "variable": {
        "id": "ocean_diffuse_attenuation_coefficient_dac",
        "name": "Ocean Diffuse Attenuation Coefficient (DAC)",
        "_links": {
          "self": {
            "href":
"http://space.oscar.wmo.int/oscar/api/v1/variables/ocean_diffuse_attenuation_coefficient_dac"
          }
        }
      }
```

```
    },
    {
      "relevancy": "5 - marginal",
      "variable": {
        "id": "ocean_suspended_sediments_concentration",
        "name": "Ocean suspended sediments concentration",
        "_links": {
          "self": {
            "href":
"http://space.oscar.wmo.int/oscar/api/v1/variables/ocean_suspended_sediments_concentration"
          }
        }
      }
    },
    {
      "relevancy": "5.2 - marginal",
      "variable": {
        "id": "cloud_top_height",
        "name": "Cloud top height",
        "_links": {
          "self": {
            "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/cloud_top_height"
          }
        }
      }
    },
    {
      "relevancy": "5.2 - marginal",
      "variable": {
        "id": "fire_fractional_cover",
        "name": "Fire fractional cover",
        "_links": {
          "self": {
            "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/fire_fractional_cover"
          }
        }
      }
```

```
},
{
  "relevancy": "5.2 - marginal",
  "variable": {
    "id": "soil_moisture_at_surface",
    "name": "Soil moisture at surface",
    "_links": {
      "self": {
        "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/soil_moisture_at_surface"
      }
    }
  }
},
{
  "relevancy": "5.3 - marginal",
  "variable": {
    "id": "integrated_water_vapour_iwv",
    "name": "Integrated Water Vapour (IWV)",
    "_links": {
      "self": {
        "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/integrated_water_vapour_iwv"
      }
    }
  }
},
{
  "relevancy": "5.45 - marginal",
  "variable": {
    "id": "cloud_cover",
    "name": "Cloud cover",
    "_links": {
      "self": {
        "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/cloud_cover"
      }
    }
  }
}
```

```
    ],
    "_links": {
      "self": {
        "href": "http://space.oscar.wmo.int/oscar/api/v1/instruments/3mi"
      }
    }
  },
```


End Point 2 - Variable: https://space.oscar.wmo.int/oscar/api/v1/variables

Example:


```
{
    "id": "cloud_base_height",
    "name": "Cloud base height",
    "sorting-criteria": "<table>\r\n<tr>\r\n<td width=\"21\"
valign=\"top\">\r\n<p> </p>\r\n</td>\r\n<td width=\"621\" valign=\"top\">\r\n<p>Each
instrument is assigned with a 5-step rating, evaluated as a blend of several elements.  For
this particular Variable, the rating is driven by:</p>\r\n<ul>\r\n<li>the exploited observing principle
(cloud radar).</li>\r\n</ul>\r\n<p> </p>\r\n<p>RATING
CRITERIA:</p>\r\n</td>\r\n</tr>\r\n<tr>\r\n<td width=\"21\"
valign=\"top\">\r\n<p>1</p>\r\n</td>\r\n<td width=\"621\" valign=\"top\">\r\n<ul>\r\n<li>-
</li>\r\n</ul>\r\n</td>\r\n</tr>\r\n<tr>\r\n<td width=\"21\" valign=\"top\">\r\n<p>2</p>\r\n</td>\r\n<td
width=\"621\" valign=\"top\">\r\n<ul>\r\n<li>-</li>\r\n</ul>\r\n</td>\r\n</tr>\r\n<tr>\r\n<td width=\"21\"
valign=\"top\">\r\n<p>3</p>\r\n</td>\r\n<td width=\"621\" valign=\"top\">\r\n<ul>\r\n<li>W-band cloud
radar</li>\r\n</ul>\r\n</td>\r\n</tr>\r\n<tr>\r\n<td width=\"21\"
valign=\"top\">\r\n<p>4</p>\r\n</td>\r\n<td width=\"621\" valign=\"top\">\r\n<ul>\r\n<li>-
</li>\r\n</ul>\r\n</td>\r\n</tr>\r\n<tr>\r\n<td width=\"21\" valign=\"top\">\r\n<p>5</p>\r\n</td>\r\n<td
width=\"621\" valign=\"top\">\r\n<ul>\r\n<li>-</li>\r\n</ul>\r\n</td>\r\n</tr>\r\n</table>",
    "variable-instruments": [
      {
        "relevancy": "3 - high",
        "instrument": {
          "id": "cpr_cloudsat",
          "acronym": "CPR",
          "name": "Cloud Profiling Radar for CloudSat",
          "_links": {
            "self": {
              "href": "http://space.oscar.wmo.int/oscar/api/v1/instruments/cpr_cloudsat"
```

```
            }
          }
        }
      },
      {
        "relevancy": "3 - high",
        "instrument": {
          "id": "cpr_earth_care",
          "acronym": "CPR",
          "name": "Cloud Profiling Radar for Earth-CARE",
          "_links": {
            "self": {
              "href": "http://space.oscar.wmo.int/oscar/api/v1/instruments/cpr_earth_care"
            }
          }
        }
      }
    ],
    "_links": {
      "self": {
        "href": "http://space.oscar.wmo.int/oscar/api/v1/variables/cloud_base_height"
      }
    }
  },
```


End Point 3 - Satellite: https://space.oscar.wmo.int/oscar/api/v1/satellites

Example:


```
{
    "id": "acrimsat",
    "acronym": "ACRIMSat",
    "fullname": "Active Cavity Radiometer Irradiance Monitor Satellite",
    "description": "<ul>\r\n<li>Single flight unit of
the ACRIMSat programme.</li>\r\n<li>Main mission: solar irradiance
monitoring.</li>\r\n</ul>",
```

```
"space_agency": "NASA",
"status": "Inactive",
"orbit": "Sunsynchronous orbit",
"launch_date": "20 Dec 1999",
"EoL": "14 Dec 2013",
"longitude": null,
"Altitude": "696",
"ECT": "10:50 desc",
"data_access_link": "https://eosweb.larc.nasa.gov/radiation-budget",
"satellite-instruments": [
 {
  "start-date": "",
  "EoL": "",
  "status": "N/A",
  "classification": [
   "Earth observation instrument",
   "Passive optical radiometer or spectrometer",
   "Moderate resolution optical imager"
  ],
  "wigos-subcomponent": [

  ],
  "instrument": {
   "id": "3mi",
   "name": "3MI",
   "fullname": "Multi-viewing Multi-channel Multi-polarisation Imager",
   "instrumenttype": "Moderate-resolution optical imager",
   "providing-agency": "ESA",
   "_links": {
    "self": {
     "href": "http://space.oscar.wmo.int/oscar/api/v1/instruments/3mi"
    }
   }
  }
 },
 {
  "start-date": "Mar 2000",
```

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      "EoL": "14 Dec 2013",
      "status": "N/A",
      "classification": [
        "Earth observation instrument",
        "Passive optical radiometer or spectrometer",
        "Solar irradiance monitor "
      ],
      "wigos-subcomponent": [

      ],
      "instrument": {
        "id": "acrim_iii",
        "name": "ACRIM-III",
        "fullname": "Active Cavity Radiometer Irradiance Monitoring - III",
        "instrumenttype": "Solar irradiance monitor",
        "providing-agency": "NASA",
        "_links": {
          "self": {
            "href": "http://space.oscar.wmo.int/oscar/api/v1/instruments/acrim_iii"
          }
        }
      }
    }
  ],
  "_links": {
    "self": {
      "href": "http://space.oscar.wmo.int/oscar/api/v1/satellites/acrimsat"
    }
  }
},
```


A restful API to deliver XML WMDR OSCAR/Space records

A restful API to retrieve observation records and return them as WMDR records in XML format for endpoint Satellite(Geo & Leo).

End Point 1 - Satellite: ***https://space.oscar.wmo.int/oscar/satellites.wmdr***

For Example:

"wigos-id27": "<?xml version=\"1.0\" encoding=\"UTF-8\"
standalone=\"yes\"?>\n<wmdr:WIGOSMetadataRecord
xmlns:gml=\"http://www.opengis.net/gml/3.2\" xmlns:xlink=\"http://www.w3.org/1999/xlink\"
xmlns:wmdr=\"http://def.wmo.int/wmdr/2017\" xmlns:gco=\"http://www.isotc211.org/2005/gco\"
xmlns:gmd=\"http://www.isotc211.org/2005/gmd\" xmlns:ns6=\"http://def.wmo.int/opm/2013\"
xmlns:ns7=\"http://def.wmo.int/metce/2013\" xmlns:om=\"http://www.opengis.net/om/2.0\"
xmlns:ns9=\"http://www.isotc211.org/2005/gts\" xmlns:sam=\"http://www.opengis.net/sampling/2.0\"
xmlns:sams=\"http://www.opengis.net/samplingSpatial/2.0\"
xmlns:xsi=\"http://www.w3.org/2001/XMLSchema-instance\"
xsi:schemaLocation=\"http://def.wmo.int/wmdr/2017
http://schemas.wmo.int/wmdr/1.0RC9/wmdr.xsd\">\n <gml:boundedBy xsi:nil=\"true\"/>\n
<wmdr:headerInformation>\n <wmdr:Header>\n <wmdr:fileDateTime>2019-06-
04T00:00:00Z</wmdr:fileDateTime>\n <wmdr:recordOwner>\n
<gmd:CI_ResponsibleParty id=\"ProvidingAgency\">\n <gmd:organisationName>\n
<gco:CharacterString>WMO(data from OSCAR Space)</gco:CharacterString>\n
</gmd:organisationName>\n <gmd:contactInfo xlink:type=\"simple\">\n
<gmd:CI_Contact>\n <gmd:address xlink:type=\"simple\">\n
<gmd:CI_Address>\n <gmd:electronicMailAddress>\n
<gco:CharacterString>oscar@groups.wmo.int</gco:CharacterString>\n
</gmd:electronicMailAddress>\n <gmd:electronicMailAddress>\n
<gco:CharacterString>https://oscar.wmo.int/surface//index.html#/support</gco:CharacterString>\n
</gmd:electronicMailAddress>\n </gmd:CI_Address>\n
</gmd:address>\n <gmd:onlineResource xlink:type=\"simple\">\n
<gmd:CI_OnlineResource>\n <gmd:linkage>\n
<gmd:URL>http://space.oscar.wmo.int/oscar/spacecapabilities</gmd:URL>\n
</gmd:linkage>\n </gmd:CI_OnlineResource>\n
</gmd:onlineResource>\n </gmd:CI_Contact>\n </gmd:contactInfo>\n
<gmd:role>\n <gmd:CI_RoleCode
codeList=\"http://www.isotc211.org/2005/resources/Codelist/gmxCodelists.xml#CI_RoleCode\"
codeListValue=\"custodian\"/>\n </gmd:role>\n </gmd:CI_ResponsibleParty>\n
</wmdr:recordOwner>\n </wmdr:Header>\n </wmdr:headerInformation>\n <wmdr:facility>\n
<wmdr:ObservingFacility> <!-- The Satellite is the Observing Facility --> \n <gml:identifier
codeSpace=\"TBD\">Sunsynchronous orbit</gml:identifier> <!-- WIGOS id for the Satellites not yet
available. We could use GEO, LEO, ... for now. --> \n <gml:name>CBERS-2B</gml:name>\n

<gml:boundedBy xsi:nil=\"true\"/>\n <wmdr:responsibleParty>\n
<wmdr:ResponsibleParty>\n <wmdr:responsibleParty>\n
<gmd:CI_ResponsibleParty>\n <gmd:organisationName>\n
<gco:CharacterString>CAST,AEB,CRESDA,INPE</gco:CharacterString>\n
</gmd:organisationName>\n <gmd:role>\n <gmd:CI_RoleCode
codeList=\"https://standards.iso.org/iso/19115/resources/Codelists/gml/CI_RoleCode.xml/owner\"
codeListValue=\"owner\"/>\n </gmd:role>\n
</gmd:CI_ResponsibleParty>\n </wmdr:responsibleParty>\n
<wmdr:validPeriod xlink:type=\"simple\">\n <gml:TimePeriod gml:id=\"id_b074e824-
41b3-7937-e053-148ef98d6de4\">\n <gml:beginPosition>16 May
2010</gml:beginPosition> <!-- Launch date for the satellite -->\n
<gml:endPosition/>\n </gml:TimePeriod>\n </wmdr:validPeriod>\n
</wmdr:ResponsibleParty>\n </wmdr:responsibleParty>\n
<wmdr:geospatialLocation>\n <wmdr:GeospatialLocation> <!-- Position --> \n
<wmdr:geoLocation>\n <gml:Point gml:id=\"centre\">\n
<gml:pos>10:30:00 desc</gml:pos>\n </gml:Point>\n
</wmdr:geoLocation>\n <wmdr:geopositioningMethod xlink:type=\"simple\"
xlink:href=\"http://codes.wmo.int/wmdr/GeopositioningMethod/gps\"/> <!-- to be checked --> \n
<wmdr:validPeriod xlink:type=\"simple\">\n <gml:TimePeriod gml:id=\"id_b074e825-
5f88-7937-e053-148ef98d6de4\"> <!-- gml id are they mandatory --> \n
<gml:beginPosition>16 May 2010</gml:beginPosition>\n <gml:endPosition/>\n
</gml:TimePeriod>\n </wmdr:validPeriod>\n </wmdr:GeospatialLocation>\n
</wmdr:geospatialLocation>\n <wmdr:onlineResource>\n
<gmd:CI_OnlineResource>\n <gmd:linkage>\n
<gmd:URL>http://space.oscar.wmo.int/oscar/spacecapabilities</gmd:URL> <!-- Is it mandatory ? -
-> \n </gmd:linkage>\n </gmd:CI_OnlineResource>\n
</wmdr:onlineResource>\n <wmdr:facilityType xlink:type=\"simple\"
xlink:href=\"http://codes.wmo.int/wmdr/FacilityType/spaceBased\"/>\n
<wmdr:dateEstablished>19 Sep 2007</wmdr:dateEstablished>\n <wmdr:wmoRegion
xlink:type=\"simple\" xlink:href=\"http://codes.wmo.int/wmdr/WMORegion/europe\"/>\n
<wmdr:territory> <!-- What is it ? Is it mandatory > Where the satellite is doing measurements --> \n
<wmdr:Territory>\n <wmdr:territoryName xlink:type=\"simple\"
xlink:href=\"http://codes.wmo.int/wmdr/TerritoryName/DEU\"/>\n <wmdr:validPeriod
xlink:type=\"simple\">\n <gml:TimePeriod gml:id=\"id_b074e825-5f88-7937-e053-
148ef98d6de4\">\n <gml:beginPosition>16 May 2010</gml:beginPosition>\n
<gml:endPosition/>\n </gml:TimePeriod>\n </wmdr:validPeriod>\n
</wmdr:Territory>\n </wmdr:territory>\n <wmdr:programAffiliation>\n

<wmdr:ProgramAffiliation>\n <wmdr:programAffiliation xlink:type=\"simple\" xlink:href=\"http://codes.wmo.int/wmdr/ProgramAffiliation/GOS\"/> <!-- What to put ? To be checked -->\n <wmdr:reportingStatus>\n <wmdr:ReportingStatus>\n <wmdr:reportingStatus xlink:type=\"simple\" xlink:href=\"http://codes.wmo.int/wmdr/ReportingStatus/operational\"/>\n <wmdr:validPeriod xlink:type=\"simple\">\n <gml:TimePeriod gml:id=\"id_b074e825-5f88-7937-e053-148ef98d6de4\">\n <gml:beginPosition>16 May 2010</gml:beginPosition>\n <gml:endPosition/>\n </gml:TimePeriod>\n </wmdr:validPeriod>\n </wmdr:ReportingStatus>\n </wmdr:reportingStatus>\n </wmdr:ProgramAffiliation>\n </wmdr:programAffiliation>\n <wmdr:observation xlink:type=\"simple\">\n <wmdr:ObservingCapability>\n <gml:boundedBy xsi:nil=\"true\"/>\n <wmdr:facility xlink:type=\"simple\" xlink:href=\"http://codes.wmo.int/wmdr/0-20000-0-06707\"/>\n <wmdr:programAffiliation xlink:type=\"simple\" xlink:href=\"http://codes.wmo.int/wmdr/ProgramAffiliation/GOS\"/>\n <wmdr:observation xlink:type=\"simple\">\n <om:OM_Observation>\n <gml:boundedBy xsi:nil=\"true\"/>\n <om:type xlink:type=\"simple\" xlink:href=\"http://codes.wmo.int/wmdr/Geometry/area\"/>\n <om:metadata xlink:type=\"simple\">\n <gmd:MD_Metadata>\n <gmd:contact xlink:type=\"simple\">\n <gmd:CI_ResponsibleParty>\n <gmd:role/>\n </gmd:CI_ResponsibleParty>\n </gmd:contact>\n <gmd:dateStamp>\n <gco:Date xsi:nil=\"true\"/>\n </gmd:dateStamp>\n <gmd:identificationInfo xlink:type=\"simple\"/>\n </gmd:MD_Metadata>\n </om:metadata>\n <om:phenomenonTime xlink:type=\"simple\"/>\n <om:resultTime xlink:type=\"simple\"/>\n <om:procedure xlink:type=\"simple\">\n <wmdr:Process>\n <gml:boundedBy xsi:nil=\"true\"/><wmdr:deployment xlink:type=\"simple\"><wmdr:Deployment gml:id=\"id-metch-762-210-dg5-inc3-depl\">\n <gml:boundedBy xsi:nil=\"true\"/>\n <wmdr:deployedEquipment xlink:type=\"simple\">\n <wmdr:Equipment><!-- Oscar Space variable -->\n <gml:boundedBy xsi:nil=\"true\"/>\n <wmdr:responsibleParty>\n <wmdr:ResponsibleParty>\n <wmdr:responsibleParty>\n <gmd:CI_ResponsibleParty>\n <gmd:role/>\n </gmd:CI_ResponsibleParty>\n </wmdr:responsibleParty>\n </wmdr:ResponsibleParty>\n </wmdr:responsibleParty>\n <wmdr:geospatialLocation>\n

<wmdr:GeospatialLocation>\n <wmdr:geoLocation>\n
<gml:Point gml:id=\"centre\">\n <gml:pos></gml:pos>\n
</gml:Point>\n </wmdr:geoLocation>\n
<wmdr:geopositioningMethod xlink:type=\"simple\"
xlink:href=\"http://codes.wmo.int/wmdr/GeopositioningMethod/gps\"/>\n
<wmdr:validPeriod xlink:type=\"simple\">\n <gml:TimePeriod
gml:id=\"id_b074e825-5f88-7937-e053-148ef98d6de4\">\n
<gml:beginPosition>15 May 2010</gml:beginPosition>\n
<gml:endPosition/>\n </gml:TimePeriod>\n
</wmdr:validPeriod>\n </wmdr:GeospatialLocation>\n
</wmdr:geospatialLocation>\n
<wmdr:manufacturer>UNKNOWN</wmdr:manufacturer>\n
<wmdr:model>Data Collection System</wmdr:model> <!-- Instrument --> \n
<wmdr:serialNumber/>\n <wmdr:observingMethod
xlink:href=\"http://codes.wmo.int/wmdr/methods/319\"/> <!-- TO be checked GAu -->\n
<!-- UV absorption spectrometry/radiometry -->\n
<wmdr:observingMethodDetails>China-Brazil Earth Resources Satellite - 2B (ZY-1 FM2B)
</wmdr:observingMethodDetails>\n
<wmdr:observableRange>\r\n3rd flight unit of the CBERS (ZY-
1) programme.\r\nMain mission: land observation.\r\n</wmdr:observableRange>\n
<wmdr:specificationLink>http://space.oscar.wmo.int/oscar/spaceagencies/view/cast,
http://space.oscar.wmo.int/oscar/spaceagencies/view/aeb,
http://space.oscar.wmo.int/oscar/spaceagencies/view/cresda,
http://space.oscar.wmo.int/oscar/spaceagencies/view/inpe</wmdr:specificationLink>\n
<wmdr:equipmentLog xlink:type=\"simple\">\n
<wmdr:EquipmentLog>\n <gml:boundedBy xsi:nil=\"true\"/>\n
<wmdr:equipment xlink:type=\"simple\"/>\n
</wmdr:EquipmentLog>\n </wmdr:equipmentLog>\n
</wmdr:Equipment>\n </wmdr:deployedEquipment>\n
<wmdr:dataGeneration xlink:type=\"simple\">\n
<wmdr:DataGeneration gml:id=\"id-metch-762-210-dg6-inc3-dage\">\n
<gml:boundedBy xsi:nil=\"true\"/>\n <wmdr:validPeriod
xlink:type=\"simple\">\n <gml:TimePeriod>\n
<gml:beginPosition>15 May 2010</gml:beginPosition>\n
<gml:endPosition/>\n </gml:TimePeriod>\n
</wmdr:validPeriod>\n <wmdr:schedule>\n
<wmdr:Schedule>\n

<wmdr:startMonth>UNKNOWN</wmdr:startMonth>\n
<wmdr:endMonth>UNKNOWN</wmdr:endMonth>\n
<wmdr:startWeekday>UNKNOWN</wmdr:startWeekday>\n
<wmdr:endWeekday>UNKNOWN</wmdr:endWeekday>\n
<wmdr:startHour>UNKNOWN</wmdr:startHour>\n
<wmdr:endHour>UNKNOWN</wmdr:endHour>\n
<wmdr:startMinute>UNKNOWN</wmdr:startMinute>\n
<wmdr:endMinute>UNKNOWN</wmdr:endMinute>\n
<wmdr:diurnalBaseTime>UNKNOWN</wmdr:diurnalBaseTime>\n
</wmdr:Schedule>\n </wmdr:schedule>\n
<wmdr:sampling>\n <wmdr:Sampling/>\n
</wmdr:sampling>\n <wmdr:reporting>\n
<wmdr:Reporting>\n
<wmdr:internationalExchange>true</wmdr:internationalExchange>\n
<wmdr:uom xlink:type=\"simple\" xlink:href=\"http://codes.wmo.int/wmdr/unit/unknown\"/>\n
<wmdr:temporalReportingInterval>UNKNOWN</wmdr:temporalReportingInterval>\n
<wmdr:timeStampMeaning xlink:type=\"simple\"/>\n
<wmdr:dataPolicy>\n <wmdr:DataPolicy>\n
<wmdr:dataPolicy xlink:type=\"simple\"/>\n
<wmdr:attribution>\n <wmdr:Attribution>\n
<wmdr:originator>\n
<gmd:CI_ResponsibleParty>\n <gmd:role/>\n
</gmd:CI_ResponsibleParty>\n </wmdr:originator>\n
</wmdr:Attribution>\n </wmdr:attribution>\n
</wmdr:DataPolicy>\n </wmdr:dataPolicy>\n
<wmdr:referenceTimeSource xlink:type=\"simple\"/>\n
<wmdr:levelOfData xlink:type=\"simple\"/>\n
<wmdr:dataFormat xlink:type=\"simple\"/>\n </wmdr:Reporting>\n
</wmdr:reporting>\n </wmdr:DataGeneration>\n
</wmdr:dataGeneration>\n <wmdr:validPeriod xlink:type=\"simple\">\n
<gml:TimePeriod>\n <gml:beginPosition>15 May
2010</gml:beginPosition>\n <gml:endPosition/>\n
</gml:TimePeriod>\n </wmdr:validPeriod>\n
<wmdr:heightAboveLocalReferenceSurface />\n
<wmdr:localReferenceSurface xlink:type=\"simple\"
xlink:href=\"http://codes.wmo.int/wmdr/ReferenceSurfaceType/localGround\"/>\n
<wmdr:applicationArea xlink:type=\"simple\"/>\n

<wmdr:sourceOfObservation xlink:type=\"simple\"
xlink:href=\"http://codes.wmo.int/wmdr/SourceOfObservation/automaticReading\"/>\n
<wmdr:exposure xlink:type=\"simple\"/>\n </wmdr:Deployment>\n
</wmdr:deployment><wmdr:Deployment gml:id=\"id-metch-762-210-dg5-inc3-depl\">\n
<gml:boundedBy xsi:nil=\"true\"/>\n <wmdr:deployedEquipment
xlink:type=\"simple\">\n <wmdr:Equipment><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.1 -
marginal,Biomass</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.8 - marginal,Cloud
cover</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.65 - marginal,Cloud
cover</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.55 - marginal,Cloud
cover</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">4.8 - fair,Cloud
optical depth</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.2 - marginal,Earth
surface albedo</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">2.3 - very high,Fire
fractional cover</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">2.4 - very high,Fire
fractional cover</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">4.1 - fair,Fraction of
Absorbed PAR (FAPAR)</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">2.1 - very
high,Fraction of vegetated land</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.2 - marginal,Glacier
cover</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.1 - marginal,Glacier
cover</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">4.1 - fair,Glacier
cover</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5 - marginal,Glacier
cover</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">4 - fair,Glacier
cover</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.4 - marginal,Glacier

topography</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.3 - marginal,Glacier
topography</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.2 - marginal,Glacier
topography</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.4 - marginal,Ice
sheet topography</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.3 - marginal,Ice
sheet topography</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.2 - marginal,Ice
sheet topography</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">2.1 - very high,Land
cover</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.4 - marginal,Land
surface topography</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.3 - marginal,Land
surface topography</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.2 - marginal,Land
surface topography</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">4.1 - fair,Leaf Area
Index (LAI)</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">2 - very
high,Normalised Difference Vegetation Index (NDVI)</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.2 -
marginal,Photosynthetically Active Radiation (PAR)</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">4.1 -
fair,Photosynthetically Active Radiation (PAR)</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.6 - marginal,Sea-
ice cover</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.5 - marginal,Sea-
ice cover</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.1 - marginal,Sea-
ice cover</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.4 - marginal,Short-
wave cloud reflectance</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.2 - marginal,Snow
cover</gml:identifier><gml:identifier

codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.1 - marginal,Snow cover</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">4.2 - fair,Snow cover</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5 - marginal,Snow cover</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">4 - fair,Snow cover</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.5 - marginal,Soil moisture at surface</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">2.1 - very high,Soil type</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.85 - marginal,Upward short-wave irradiance at TOA</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">3 - high,Vegetation type</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.6 - marginal,Aerosol volcanic ash</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.5 - marginal,Aerosol volcanic ash</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.6 - marginal,Aerosol volcanic ash Total Column</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">5.5 - marginal,Aerosol volcanic ash Total Column</gml:identifier><gml:identifier
codeSpace=\"http://codes.wmo.int/wmdr/ObservedVariableAtmosphere/210\">2 - very high,Ocean subsurface tracers</gml:identifier><!-- Oscar Space variable -->\n
<gml:boundedBy xsi:nil=\"true\"/>\n <wmdr:responsibleParty>\n
<wmdr:ResponsibleParty>\n <wmdr:responsibleParty>\n
<gmd:CI_ResponsibleParty>\n <gmd:role/>\n
</gmd:CI_ResponsibleParty>\n </wmdr:responsibleParty>\n
</wmdr:ResponsibleParty>\n </wmdr:responsibleParty>\n
<wmdr:geospatialLocation>\n <wmdr:GeospatialLocation>\n
<wmdr:geoLocation>\n <gml:Point gml:id=\"centre\">\n
<gml:pos></gml:pos>\n </gml:Point>\n
</wmdr:geoLocation>\n <wmdr:geopositioningMethod
xlink:type=\"simple\" xlink:href=\"http://codes.wmo.int/wmdr/GeopositioningMethod/gps\"/>\n
<wmdr:validPeriod xlink:type=\"simple\">\n <gml:TimePeriod

gml:id=\"id_b074e825-5f88-7937-e053-148ef98d6de4\">\n
<gml:beginPosition>16 May 2010</gml:beginPosition>\n
<gml:endPosition/>\n </gml:TimePeriod>\n
</wmdr:validPeriod>\n </wmdr:GeospatialLocation>\n
</wmdr:geospatialLocation>\n
<wmdr:manufacturer>UNKNOWN</wmdr:manufacturer>\n
<wmdr:model>High-Resolution CCD Camera</wmdr:model> <!-- Instrument --> \n
<wmdr:serialNumber/>\n <wmdr:observingMethod
xlink:href=\"http://codes.wmo.int/wmdr/methods/319\"/> <!-- TO be checked GAu -->\n
<!-- UV absorption spectrometry/radiometry -->\n
<wmdr:observingMethodDetails>China-Brazil Earth Resources Satellite - 2B (ZY-1 FM2B)
</wmdr:observingMethodDetails>\n
<wmdr:observableRange>\r\n3rd flight unit of the CBERS (ZY-
1) programme.\r\nMain mission: land observation.\r\n</wmdr:observableRange>\n
<wmdr:specificationLink>http://space.oscar.wmo.int/oscar/spaceagencies/view/cast,
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http://space.oscar.wmo.int/oscar/spaceagencies/view/cresda,
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