

MULTI-SATELLITE DATA VISUALIZATION SOFTWARE: GMV'S SOLUTION FOR EARTHCARE AND AEOLUS PRODUCTS

Browse Processor generates versatile "previews", called browses, of data acquired by core Earth Explorer satellite missions EarthCARE and ADM-Aeolus in a form of static images with additional metadata included. The output can be a two-dimensional image/map or an image in KML format, which can be displayed in a three-dimensional Earth browser, such as Google Earth.

The content and the layout of the output images is adjustable to a great extent. The user can select, filter and reduce the data to be visualised, as well as configure its appearance on the plots. This is done by using configuration files based on xml format, which is easy to modify and share.

The processor can be operated twofold:

- as a stand-alone application
- as an autonomous part of the Payload Data Ground Segment

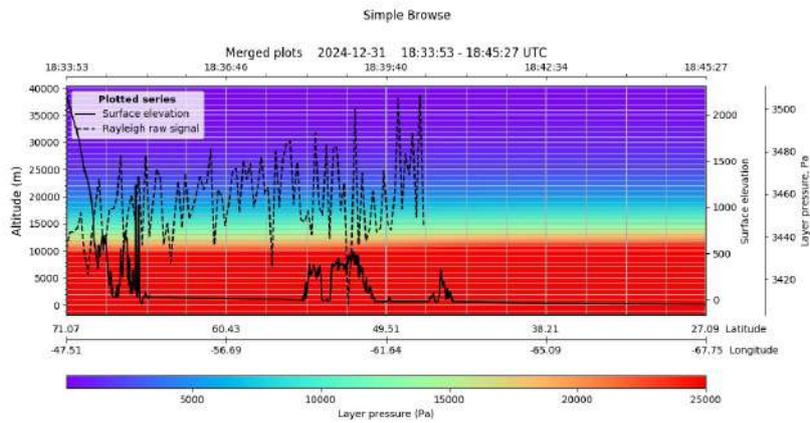
In both modes the Browse Processor is very effective in producing browses with standardized content and layout for large amount of data.

The support of different satellite missions can be extended by a plugin functionality, e.i. user provides a Python module, containing custom methods for extracting the data from structured product.

PLOTS

This processor generates in an automatized way different types of plots that are of user interest. The following types of plots are defined:

- **Basic** –plots any two parameters against each other. It is a generic X-Y plot. Can be used, for example, for representing the evolution of two parameters along the satellite track. Additionally, the latitude/longitude of the ground track can be represented on the x axis.
- **Trajectory** – plots ground track of the satellite.
- **Merged** – allowing to over-plot many variables on the same canvas sharing axes between plots.
- **Adjacent** – it is a plot showing multiple parameters, splitting track into segments and marking the data accordingly.
- **Vertical Curtain** - represents the variation of a 2D parameter corresponding to a vertical profile, with a single value for each position along track and each altitude value.
- **Vertical Curtain 3D** - This is a specific plot type mapping vertical curtain data on a 3D map of an Earth browser like Google Earth. In this case a KMZ or ngEO output file is created, which contains the images and the metadata needed to present the data in a 3D world map.
- **Surface strips in native projection** - This plot represents the variation of a 2D parameter corresponding to a horizontal surface, sampled over a grid corresponding to the instrument native projection covering the whole duration of the product, from its start time up to its stop time.
- **Geolocated Surface strips** – This plot represents the variation of a 2D parameter corresponding to a horizontal surface, sampled over a grid corresponding to the instrument native projection covering the whole duration of the product, from its start time up to its stop time and with information about its geolocation.
- **Rectified surfaces strips** – This browse is similar to the Geolocated Surface strips but the 2 dimensional grid where the parameter is sampled is rectified to a coordinate reference system (e.g. UTM). This means that instead of providing the geo-location information for each single point of the grid it is sufficient to provide latitude and longitude of two corners of the grid.



BROWSE PROCESSOR

The Browse Processor is able to generate plots in two different ways:

- **Job Order mode:** it will receive a Job Order file as input, which contains the location and filename of the input product and the location and filename of the Auxiliary Data File.
- **Standalone mode:** No Job Order is required in this mode. The processor will receive the location of the input product and the location of the Auxiliary Data File via command line.

The BRPF processor has a modular architecture. The processing chain can be subdivided in three different stages:

- **Pre-processing.** In this first processing step, the BRPF, depending on the inputs it has received, detects the execution mode: Job Order mode or Standalone mode. Depending on the mode, the BRPF will call the proper modules for reading the input data.
- **Processing.** In this step, there are two sub-steps:
 - **Data Extraction.** This module gets the requested data from the product. The Data Extraction Syntax provides paths to the specific data subsets. This

syntax specifies which data subset must be extracted from the input product, allowing also a basic data manipulation or filtering.

- **Browse Generation.** This sub-step contains several modules for performing the different tasks involved in the generation of the browses and their metadata.
 - **Rescaling & Down sampling.** The following functions are implemented:
 - Application of a down sampling factor on each axis of the extracted dataset.
 - Rescaling of the image to a certain size in pixels for each dimension (with the option of maintaining the aspect ratio).
 - **Color Mapping.** This module will map the values to pixel color.
 - **Plotting & Visualization.** This module will produce the corresponding plot for the type of input product.
 - **Metadata Generation.** This module will produce, if needed, the metadata associated with the output format required.
- **Post-Processing.** This step performs the compression and image formatting.

