

Sen2Agri MAJA Atmospheric Correction Service (Sen2Agri L2A)

Note this service and the product specification has been developed within the ESA-sponsored Sentinel-2 for Agriculture (Sen2Agri) project. Further details of this project and its products can be found here: <http://www.esa-sen2agri.org/>.

Service description

Bottom-of-atmosphere Reflectance values with snow, water, cloud and cloud shadow masks.

This service applies atmospheric correction to input Sentinel-2 L1C images to create a bottom of the atmosphere reflectance L2A image. This is an important step to enable the image to be subsequently used to generate more advanced scientific measurements. used to derive quantitative measures.

The atmospheric correction algorithm applied is the MACCS-ATCOR Joint Algorithm (MAJA), which has been developed by CESBIO, CNES and DLR. MAJA is an evolution of the MACCS algorithm which has been updated to include some methods inspired by the Atmospheric correction (ATCOR) software. MACCS (Multi-sensor Atmospheric Correction and Cloud Screening) is a level 2A processor, which detects the clouds and their shadows, and estimates aerosol optical thickness (AOT), water vapour and corrects for the atmospheric effects. MACCS was jointly developed by CESBIO and CNES.

This service allows the creation of L2A data that is the required input for the other Sen2Agri services. **As such it is a necessary precursor service for all other Sen2Agri services.**

Selecting the service

The MAJA Atmospheric Correction service is selected by clicking on the *Services*  icon on the left of the screen on the *Explorer pane*. This opens up the Service list, which can be filtered by service type (such as application or processor). Scroll down or type into the search interface the name of the service and after selection the *Workspace*  panel will open.

Input data

A **Sentinel-2 L1C** image.

Parameters

- **Processor Running Mode:** The Processors can be run in two modes **standard** or **systematic**. Most users will just require standard processing i.e. processing of one or more products in a single processing run. For advanced users, systematic processing allows the service to be run periodically if the platform identifies input data that matches the user-defined criteria.
- **Sentinel-2 data:** this is the input Sentinel-2 L1C image to be processed. Drag the input Sentinel-2 image (grabbing from the horizontal lines to the left of its name) from the Results tab at the bottom of the screen to the Input data field.
- **The previous L2A file:** An OPTIONAL field for the users to provide details of previously generated L2A products. The MACCS/MAJA processor may be run in 2 modes: L2INIT and L2NOMINAL. The former will be used if there aren't any previously processed tiles by MACCS/MAJA. The latter will be used if there are already previously processed tiles and can be used by MACCS/MAJA to enhance the final result. The tiles should be inserted as a list separated by spaces.

- **Label:** An OPTIONAL field for free form tagging for later identification of this processing job.

Service Outputs

The Sen2Agri MAJA Atmospheric Correction service will generate numerous outputs:

- A zip file containing the generated Sentinel-2 L2A image along with ancillary information.

Service Execution

Once all input fields have been filled in, the service is launched by clicking the round play button at the bottom right corner of the input dialogue area.

The resulting outputs files can be downloaded or further used in other services, particularly the other Sen2Agri services.

Additional further analysis can be undertaken in one of the GUI applications, such as SNAP, QGIS or Monteverdi. Soon after desired application process (e.g. QGIS) is started, a 'Go to GUI' icon appears in the job description. The desired GUI application can then be accessed by clicking this icon, which opens the GUI in another browser tab.

