IAF EARTH OBSERVATION SYMPOSIUM (B1)
Earth Observation Data Systems and Technology (4)

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PRISMA TOOLBOX, A DESKTOP TOOL FOR THE INGESTION AND PROCESSING OF HYPERSPECTRAL MISSIONS DATA

Abstract

PRISMA (PRecursore IperSpettrale della Missione Applicativa) is the first Italian hyperspectral mission launched in March 2019 by the Italian Space Agency. It is equipped with an electro-optical payload composed by a pushbroom Imaging Spectrometer, able to acquire data in a continuous region ranging from 400 to 2500 nm, and a medium resolution panchromatic camera. The end users can access different products levels: PRISMA Level 1, providing the Top Of Atmosphere (TOA), radiometrically calibrated HYP and PAN radiance images and Level 2, providing geo-located (L2b, L2c) and geo-coded (L2d) atmospherically corrected surface radiance and reflectance images together with atmospheric constituent maps. Since the PRISMA launch, some specific applications or plug-ins have been developed to support users in the managing of mission data, and have contributed to the dissemination of the mission's products to the scientific community. With this in mind, Prisma Toolbox aims to become the reference application for the mission, allowing the end user to have a self-consistent environment both for ingestion of the products they can access and for processing. Indeed, the toolbox through its HMI, allows quick interaction with data and metadata, thanks to fast visualization and geo-localized navigation of individual bands, visualization of spectral signatures at the pixel level, data interpretation capabilities, enrichment with graphical features for metadata representation and export capabilities to other formats. All that is supported by the multi-monitor visualization, which allows band comparison and co-registered navigation of bands. In addition, it supports the user with the ability to directly process data and visualize results at run-rime thanks to the implemented native C++ API and Python API, thus providing a base of hyperspectral processing tools already available or created by the user, thanks to an embedded editor, and pluggable into the application library. It also will support, by Q4 2023, ingestion of products of the German hyperspectral mission EnMap, managing its product specification and extending the visualization and manipulation functionalities to those data as well.