EARTH OBSERVATION SYMPOSIUM (B1)
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THE PRISMA MISSION HYPERSPECTRAL PAYLOAD EXTENDED ACQUISITION CAPABILITIES

Abstract

The PRISMA (PRecursore IperSpettrale della Missione Applicativa) Programme is an ASI (Agenzia Spaziale Italiana) hyperspectral mission for Earth observation based on a mono-payload satellite. An Italian Consortium is in charge to realize the mission; FINMECCANICA has the full responsibility of the hyperspectral payload, composed by a high spectral resolution spectrometer optically integrated with a medium resolution panchromatic camera, and the related calibration activities. PRISMA, from a sun-synchronous orbit at about 620km altitude, acquires areas with a swath width of 30km with a Ground Sampling Distance (GSD) of 30m, covering the wavelength range from 400nm to 2500nm with two partially overlapped spectrometer channels dedicated to VNIR and SWIR. Simultaneously, a panchromatic camera acquires the same area with a spatial resolution of 5m GSD. A recent update of overall mission design has extended the Area of Interest that now includes all the area between 70S and 70N latitude. An increase of the daily image capacity from 108.000km2 up to 200.000km2 is the main impact on the Payload design and performances: a lossless data compression is implemented within Payload Main Electronic and it enables a compression factor on hyperspectral data of at least 1.6 (lossless algorithm) or higher (near-lossless algorithm). The compression algorithm is an extension of CCSDS 123 with a modified entropy coder (Golomb entropy encoder).