

# Proba-1: Current Status and Calibration Assessment

Sam Lavender<sup>1</sup>, Mike Cutter, Giuseppe Ottavianelli, Roberto Biasutti, Andrea Schedid, Frederic Teston, Etienne Tilmans, Tim Pearson, Rita Malosti, Connie Clark and Elliott Worsley

1) Sam.Lavender@telespazio.com, Telespazio VEGA UK Ltd

## Abstract

Originally designed as a two-year mission, and launched in October 2001, the Project for OnBoard Autonomy-1 (Proba-1) continues to support ESA's Earthnet Programme. With orbital drift, the mission has provided both ascending and descending mode data since 2014 and the Local Time of Descending Node (LTDN) is currently 02:59. Its Compact High Resolution Imaging Spectrometer (CHRIS) can provide up to 62 channels over the 400-1050 nm spectral range, operating in five different acquisition modes. The data is acquired for specific sites using the chosen acquisition mode, which may focus on having the maximum number of channels or highest spatial resolution depending on the application that can be marine and/or terrestrial; 17 m nadir ground sampling distance is the highest-possible spatial resolution. Also, Proba-1 can acquire multiple views of the same target at up to five different viewing angles:  $\pm 55^\circ$ ,  $\pm 36^\circ$  and the standard nadir view; with off-track also available on request.

In the 18+ years of operation, the programmability of CHRIS's spectral and spatial sampling has given rise to many investigations and findings, aiding the definition of future hyperspectral imaging missions for both scientific and service-oriented operational applications; including, potentially, the Copernicus Expansion Sentinel candidate 'CHIME'. The acquisition nominal plan has been expanded to include the eight instrumented Committee on Earth Observation Satellites (CEOS) LANDNET Reference Test Sites ([https://calval.cr.usgs.gov/rst-resources/sites\\_catalog/ceos-reference-sites/](https://calval.cr.usgs.gov/rst-resources/sites_catalog/ceos-reference-sites/)), with additionally, some of the pre-existing Principle Investigator (PI) sites systematically collected throughout the mission's lifetime. As a result, current activities are focused on understanding the changes in radiometric calibration alongside developing improved processing techniques that take advantage of the information provided by this unique time-series.

The presentation will place CHRIS-Proba within the context of both historical and future missions, and showcase results from the on-going activities that will not only allow the PIs and broader community to make better use of this dataset but also provide an enhanced understanding of requirements related to hyperspectral satellite missions.

**Keywords** - Cross Calibration / Validation