

IAF EARTH OBSERVATION SYMPOSIUM (B1)
Interactive Presentations - IAF EARTH OBSERVATION SYMPOSIUM (IP)

Author: Dr. Nicole Pinnel
German Aerospace Center (DLR), Germany, nicole.pinnel@dlr.de

Dr. Tobias Storch
German Aerospace Center (DLR), Germany, tobias.storch@dlr.de

Mr. Hans-Peter Honold
OHB System AG - Munich, Germany, hans-peter.honold@ohb.de

Mr. Martin Habermeyer
German Aerospace Center (DLR), Germany, martin.habermeyer@dlr.de

Mr. Paul Tucker
OHB System AG - Munich, Germany, paul.tucker@ohb.de

Dr. Andreas Ohndorf
DLR (German Aerospace Center), Germany, andreas.ohndorf@dlr.de

Mrs. Katrin Wirth
German Aerospace Center (DLR), Germany, katrin.wirth@dlr.de

Mr. Sebastian Löw
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany, sebastian.loew@dlr.de

Mr. Steffen Zimmermann
DLR (German Aerospace Center), Germany, steffen.zimmermann@dlr.de

Mr. Matthias Betz
OHB System AG - Oberpfaffenhofen, Germany, matthias.betz@ohb.de

Mr. Michael Kuchler
OHB System AG - Oberpfaffenhofen, Germany, michael.kuchler@ohb.de

Dr. Emiliano Carmona
German Aerospace Center (DLR), Germany, emiliano.carmona@dlr.de

Mr. Mathias Schneider
German Aerospace Center (DLR), Germany, mathias.schneider@dlr.de

Dr. Peter Schwind
German Aerospace Center (DLR), Germany, peter.schwind@dlr.de

Mr. Helmut Mühle
German Aerospace Center (DLR), Germany, helmut.muehle@dlr.de

Dr. Martin Mücke
OHB System AG - Munich, Germany, martin.muecke@ohb.de

Mr. Simon Baur
OHB System AG - Munich, Germany, simon.baur@ohb.de

Dr. Martin Bachmann
German Aerospace Center (DLR), Germany, martin.bachmann@dlr.de

Prof. Sabine Chabrilat
German Research Centre for Geosciences (GFZ), Germany, chabri@gfz-potsdam.de

Dr. Sebastian Fischer
German Aerospace Centre (DLR), Germany, sebastian.fischer@dlr.de

THE ENMAP EARLY ORBIT AND COMMISSIONING PHASE

Abstract

EnMAP (Environmental Mapping and Analysis Program, www.enmap.org) is a high-resolution imaging spectroscopy mission, which is scheduled to be launched in April 2022. The mission relies on a prism-based dual-spectrometer with a spectral sampling distance between 4.8 nm and 8.2 nm for the VNIR and between 7.4 nm and 12.0 nm for the SWIR. An on-board doped Spectralon sphere enables a spectral accuracy of better than 1.0 nm. The target signal-to-noise ratio (SNR) is 500:1 at 495 nm and 150:1 at 2200 nm (at reference radiance level representing 30% surface albedo, 30° sun zenith angle, ground at sea level, and 40 km visibility with rural atmosphere). Sun calibration measurements with an on-board full-aperture diffuser enable a radiometric accuracy of better than 5%. Additional measurements, e.g. for non-linearity and closed shutter measurements for subtraction of dark signal, complement the calibration. Each detector array has 1000 valid pixels in spatial direction with an instantaneous field-of-view of 9.5 arcsec. Thereby, a geometric resolution of 30 m and a swath width (across-track) of 30 km is realized. A swath length (along-track) of 5000 km, split to several observations, is reached per day. The repeat cycle of 398 revolutions in 27 days combined with an across-track tilt capability of 30° enables a target revisit time of less than 4 days. And each region is viewable under an out-of-nadir angle of at most 5°. The local time of descending node is 11:00 am. After successful launch, the Early Orbit Phase (LEOP) (0.5 months) covers the first contact with satellite after separation, setting up telemetry and telecommand communications, continuous monitoring of health status, checkout and configuration of all platform functions, activation and calibration of sensors and actuators, and acquisition of required orbital parameters. The Commissioning Phase (CP) (5.5 months) covers the activation of the instrument data storage and all payload functions including the first image acquisition, downlink and processing. This leads to product approval expected to be accessible for users in October 2022. For the routine phase (54 months) all elements are supervised, the satellite is kept in the required orbit, data are acquired and dumped according to the requests, and quantitative imaging spectroscopic measurements substantially improving remote sensing standard products and allowing advantageous user-driven information products are processed and delivered to the users. EnMAP operational activities are planned to be continued until April 2027.