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TROPOMI ONE YEAR IN-ORBIT: EXCELLENT TEAM WORK, EXCELLENT RESULTS.

Abstract

On Friday the 13th of October 2017 the Sentinel-5 precursor satellite was launched. This sixth launched satellite of the European Copernicus programme carries a single atmospheric monitoring instrument "TROPOMI".

TROPOMI (TROPOspheric Monitoring Instrument) is a multi-channel spectrometer performing observations on air quality and climate related trace gases and aerosols in the atmosphere by passively analysing scattered Solar light. TROPOMI is equipped with four spectrometers covering the ultra-violet (UV), visible (VIS), near-infrared (NIR) and short-wave Infrared (SWIR) spectra. The resulting data products include amongst others ozone (O3), sulphur-dioxide (SO2), nitrogen-dioxide (NO2), carbon monoxide (CO), formaldehyde (CH2O) and methane (CH4). Compared to its predecessors, TROPOMI sets a new standard for these types of instruments by increasing the sensitivity and spectral resolution as well as increasing the spatial resolution to 7 x 7 km, combined with daily global coverage.

To keep the time-to-launch short and to keep the programme costs low, it was chosen to work in integrated teams at several levels and in several phases during the programme definition, the development and the calibration phases. These integrated teams included the agencies, science partners, institutes and industry. Another important factor contributing to high project execution efficiency and technical risks reduction is the extensive experience available from previous programmes like OMI, SCIAMACHY and GOME.

The instrument in-orbit commissioning, starting with the switch-on, followed by the cool-down and thermal stabilisation and functional check-out, was conducted as planned. Immediately the instrument showed perfect health and performance. Meanwhile the science teams received and processed the first imagery data which quality exceeded their expectations. After the instrument initial in-orbit calibration and validation phase TROPOMI has started serving science teams worldwide with daily global coverage of atmospheric measurements with unprecedented quality in terms of resolution and sensitivity.

This paper will provide insight into the design of TROPOMI and into key elements like working in integrated teams that resulted in this excellent contribution to the Copernicus programme.

Sentinel-5 Precursor is an ESA mission on behalf of the European Commission. TROPOMI is a project in partnership between Airbus Defence and Space, KNMI, SRON and TNO, commissioned by Netherlands Space Office (NSO) and ESA. Airbus Defence and Space is the prime contractor for the construction phase, in which TNO and SSTL delivered the spectrometer assemblies. KNMI and SRON are responsible for the scientific management. TROPOMI is jointly funded by ESA and the Kingdom of the Netherlands with NL Programme management by NSO.