

## Overview of Early Results from TROPOMI on the Copernicus Sentinel 5 Precursor

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On 13 October 2017 the Copernicus Sentinel 5 Precursor (S5P), the first of the European Sentinel satellites dedicated to monitoring of atmospheric composition, was launched. The mission objectives of S5P are to globally monitor air quality, climate and the ozone layer in the time period between 2017 and 2023. The first 6 months of the mission are used for special observations to commission the satellite and the ground processing systems; the operational phase will start in April of 2018.

The single payload of the S5P mission is TROPOspheric Monitoring Instrument (TROPOMI), which has been developed by The Netherlands in cooperation with the European Space Agency (ESA). TROPOMI is a nadir viewing shortwave spectrometer that measures in the UV-visible wavelength range (270-500 nm), the near infrared (710-770 nm) and the shortwave infrared (2314-2382 nm).

A major step forward of TROPOMI compared to its predecessors OMI (Ozone Monitoring Instrument) and SCIAMACHY (Scanning Imaging Absorption Spectrometer for Atmospheric Chartography) is the spatial resolution. For most of the UV-visible bands TROPOMI has a spatial resolution at nadir of  $3.5 \times 7 \text{ km}^2$  and  $7 \times 7 \text{ km}^2$  for the shortwave infrared, while maintaining or even improving the signal-to-noise per ground pixel. The high spatial resolution is combined with a wide swath that allows for daily global coverage. The TROPOMI/S5P geophysical (Level 2) operational data products include nitrogen dioxide, carbon monoxide, ozone (total column, tropospheric column & profile), methane, sulfur dioxide, formaldehyde and aerosol and cloud parameters.

The S5P will fly in a so-called loose formation with the U.S. Suomi NPP (National Polar-orbiting Partnership) satellite. The primary objective for this formation flying is to use the high spatial resolution cloud observation capabilities of the VIIRS (Visible Infrared Imager Radiometer Suite). The temporal separation between TROPOMI and VIIRS is less than 5 minutes. This formation enables synergistic data products and scientific research potentials.

In this contribution, we will present an overview of the TROPOMI mission and results obtained early in the mission.