

S5P/TROPOMI: The first year in orbit

Veefkind, Joris Pepijn; Aben, Ilse; Dehn, Angelika; Kleipool, Quintus; Landgraf, Jochen; Loyola, Diego G.; Richter, Andreas; van Roozendaal, Michel; Levelt, Pieterfel Felicitas

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A51A-01: S5P/TROPOMI: The first year in orbit (Invited)

Friday, 14 December 2018

08:00 - 08:20

📍 *Walter E Washington Convention Center - 144A-C*

On 13 October 2017 the European Sentinel 5 Precursor was successfully launched, with on board the TROPOMI (TROPOspheric Monitoring Instrument). TROPOMI is an imaging spectrometer developed by The Netherlands and ESA for monitoring the atmospheric composition, for air quality climate and ozone layer monitoring. The launch of TROPOMI marks the start of operational atmospheric composition measurements from space within the European Copernicus programme, the largest Earth observation programme in the world.

After one month of instrument checkout, the first light of TROPOMI was received in November 2017. During the commissioning phase the TROPOMI instrument settings were optimized. This included an increase in the spatial sampling from 7×7 to 3.5×7 km² (across track x along track), for most of the TROPOMI spectral bands.

The S5P commissioning phase was completed half a year after launch and on 30 April 2018 the routine operations were started. The first batch of data products was publicly released on 11 July 2018. By the time of the AGU fall meeting, almost all the data products must have been released.

TROPOMI has provided very exciting results during its first year in orbit. Very remarkable are the plumes of short-lived gases like NO₂, which can extend several tens of kilometers from the source. These plumes were predicted by air quality models; however it requires the spatial resolution of TROPOMI to see them from space. Also, the CO maps have attracted a lot of attention. Because of the high sensitivity for the entire vertical column, both the sources as well as the transport of CO are clearly visible in the TROPOMI data.

The high spatial resolution of the TROPOMI data also poses new challenges. More than for the previous satellite sensors, the need for accurate modelling of the surface reflectance becomes clear. Also, the 3D effects of clouds are now more prominent. All these aspects are also important for the upcoming geostationary missions within the CEOS air quality constellation.

In this presentation an overview will be given of the status of the mission, including the in-orbit calibration and the data products. Specific results will be highlighted that illustrate the new capabilities of TROPOMI and also the challenges that need to be addressed in future updates of the data products.

Authors

Joris P Veefkind

*Royal Netherlands
Meteorological Institute
(KNMI)*

Ilse Aben

*SRON, Netherlands Institute
for Space Research*

Angelika Dehn

*European Space Research
Institute*

Quintus Kleijpool

*Royal Netherlands
Meteorological Institute*

Jochen Landgraf

*SRON, Netherlands Institute
for Space Research*

Diego G Loyola

German Aerospace Center

Andreas Richter

University of Bremen

Michel Van Roozendael

*Royal Belgian Institute for
Space Aeronomy*

Richard Siddans

*Rutherford Appleton
Laboratory*

Thomas Wagner

*Max Planck Institute for
Chemistry*

Claus Zehner

*European Space Research
Institute*

Pieterneel Levelt

Delft University of Technology

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