

IAF EARTH OBSERVATION SYMPOSIUM (B1)
Earth Observation Applications, Societal Challenges and Economic Benefits (5)

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AIR QUALITY SERVICES USING TROPOMI AND BEYOND AND THE LOTOS-EUROS CTM

Abstract

The launch of TROPOMI on Friday the 13th of October 2017 on ESA's Sentinel-5 precursor satellite provides a major step in obtaining global Air Quality data useful on regional scale: TROPOMI for the first time provides sufficient spatial resolution and sensitivity to contribute to regional air quality monitoring.

Airbus is setting up an Air Quality service using amongst other this data and The LOTOS-EUROS Chemical Transport Model, for regional use but anywhere on the globe. The service does consider other measurement data and even a dedicated satellite system with small, dedicated instruments but at a higher spatial resolution.

The service contains the following components: - Concentrations: concentration measurements NO₂, derived products (Ozone, aerosol index), gridded maps, at spatial resolution 1 km - Monitoring: high-resolution (> 100 m) urban air quality monitoring - Sources: dynamic emission source allocation; this is also for methane but at TROPOMI resolution - Apportionment: air pollution source apportionment

Concentrations provides source detection and source emission estimates based on air quality measurements from satellites. This enables environmental agencies, port authorities and industrial areas to monitor their emissions. Emission monitoring enables to make emission agreements, which enables to balance economic with environmental decisions.

Monitoring will deliver a high spatial and temporal resolution air quality overview of an urban area. This will enable city authorities and citizens to know where and when pollution hotspots are and to adjust policy and behaviour accordingly.

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Apportionment will deliver a quantitative assignment of a fraction of the air pollution in a certain area to one or more sources. This will provide policy makers insight on how to most effectively improve the air quality situation in a certain area.

The paper will describe the service in detail, the novel satellite monitoring system and will describe how Airbus came to setting up this system.