ABSTRACT- Ozone satellite data synergy and combination with non-satellite data in the AURORA project

The geostationary satellite constellation composed of TEMPO (North America), SENTINEL-4 (Europe) and GEMS (Asia) missions is a major instance of space component in the fundamentally new paradigm aimed at integrating information on air quality from a wide variety of sources.

Space-borne data on tropospheric composition from new generation satellites have a growing impact in this context because of their unprecedented quantity and quality, while merging with non-satellite measurements and other types of auxiliary data via state-of-the-art modelling capabilities remains essential to fit the purpose of highly accurate information made readily available at high temporal and spatial resolution, both in analysis and forecast mode.

Proper and effective implementation of this paradigm poses severe challenges to science, technology and applications that must be addressed in a closely interconnected manner to pave the way to high quality products and innovative services.

Novel ideas and tools built on these three pillars are currently under investigation in the AURORA (Advanced Ultraviolet Radiation and Ozone Retrieval for Applications) Horizon 2020 project of the European Commission. The primary goal of the project is the proof of concept of a synergistic approach to the exploitation of Sentinel-4 and -5 Ozone measurements in the UV, Visible and Thermal Infrared based on the combination of an innovative data fusion method and assimilation models.

The scientific objective shares the same level of priority with the technological effort to realize a prototype data processor capable to manage the full data processing chain and with the development of two downstream applications for demonstration purposes.

The presentation offers a first insight in mid-term results of the project, which is mostly based on the use of synthetic data from the atmospheric Sentinels. Specific focus is given to the role of satellite data synergy in integrated systems for air quality monitoring, in particular when testing the impact of TEMPO and GEMS Ozone data in AURORA. As a further element relevant for the integration of multiple data sources, we describe the AIR-Portal application, which is going to combine AURORA partial columns of tropospheric ozone with other source of information for air quality analysis and forecast in metropolitan areas.