

AURORA project: Advanced Ultraviolet Radiation and Ozone Retrieval for Applications

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AURORA is a three years project supported by the European Union after evaluation of the proposal submitted in response to the call EO-2-2015 “Stimulating wider research use of Copernicus Sentinel Data” of the sub-programme Space in the frame of the Horizon 2020 framework programme.

The primary goal of AURORA is to exploit the complementary measurement capabilities of the instruments on board the Sentinel-4 and Sentinel-5 missions of Copernicus, operating on Low Earth Orbit (LEO) and on Geostationary Orbit (GEO) respectively, for near real-time monitoring of the ozone vertical profile with unprecedented accuracy. All the activities of the project will be conducted by using simulated data of Sentinel-4 and Sentinel-5.

Innovative scientific approaches and technological solutions will be applied to derive a unique geophysical product from the operational ozone data from independent datasets simultaneously acquired by observing the same air masses in different spectral regions and viewing geometries.

New data fusion techniques will combine the information associated to the operational products of the LEO instruments, as well as to the ones of the GEO mission. The fused ozone profiles will be merged into assimilation models, to integrate in particular the combined LEO and GEO products in a short-term ozone-forecasting model.

Specific focus of the project will be on the lowermost atmospheric layers to derive ozone partial column values (e.g., lower tropospheric column) and UV radiation reaching the Earth’s surface.

A dedicated technological infrastructure, exploiting virtual machine and cloud data sharing, will be created to implement the data processing chain, including a geo-database and web services for data access. The AURORA infrastructure aims to guarantee the most user-friendly access to the output products, indeed to stimulate a wider use of the huge amount of data, which we expect to become available with the atmospheric Sentinels.

This first priority purpose will be pursued, in fact, by developing two downstream applications based on the AURORA data products; for personal UV dosimetry and for providing air quality information in major cities and improving air quality prediction at regional scale.