

# Overview of the Aerosol Remote Sensing in the Context of Operational Missions

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Satellite observations of aerosol properties are of critical importance for a number of established and emerging applications that serve a wide user community such as the atmosphere and air quality monitoring services, national weather prediction, warning and advisory centers, or climate analysis. The provision of operational aerosol products implies a sufficient level of quality, a documented and monitored performance, a near real-time data dissemination, a reliability in term of data distribution, but also a retrieval optimized with respect to the user needs. To support these NRT operational needs, EUMETSAT is currently operating two aerosol processors providing aerosol optical depth (AOD) as well as some other aerosol parameters: the Polar Multi-Sensor Aerosol product (PMAp), the first operational aerosol synergistic product from the Metop platforms [1], and the Optimised Simultaneous Surface Aerosol Retrieval with Copernicus Sentinel-3 (OSSAR-CS3) derived from the SLSTR dual-view acquisitions on Sentinel-3 platforms [2]. The presentation will report on recent significant progress for both products which are assimilated (or under testing) by CAMS. A significant breakthrough comes with the polarimeter 3MI on-board Metop-SG [3]. 3MI is a heritage of the POLDER instruments, with enhanced capabilities (9 polarised channels from 410 to 2200 nm, 4km nadir resolution for a 2200km swath) The operational aerosol retrieval will rely on the GRASP framework under implementation and optimisation to the 3MI information content [5]. The Copernicus CO2M mission will also carry a Multi-Angle Polarimeter (MAP) for which operational aerosol products will be generated based on the GRASP framework. This will require a specific optimisation for the need of atmospheric correction in the SWIR domain supporting the retrieval of greenhouse gases. Another step forward is the development of synergistic products. Combining the information content from different sensors, the set of aerosol parameters, and/or their associated performance, can be significantly enhanced. A Multi-Aerosol Product (EPS-SG/MAP) will be proposed, as a follow-on of PMAp, combining the instruments from the Metop-SG platform, i.e. 3MI, METimage, Sentinel-5/UVNS, and IASI-NG. The synergy will be also developed for other platform, especially for Sentinel-3 for which the spectral information can be enriched by combining SLSTR with OLCI, and by extension to Sentinel-3 Next Generation. In a longer term perspective, the synergy developed for EPS-SG could also be implemented for Meteosat Third Generation, combining FCI, Sentinel-4/UVN, and IRS instruments. The presentation will overview all these aspects, including the impacts in term of harmonization and standardization of methodologies and tools.

**Keywords:** aerosol retrieval, operational products, synergy, methodology

## References

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- [5] Dubovik et al., “Statistically optimized inversion algorithm for enhanced retrieval of aerosol properties from spectral multi-angle polarimetric satellite observations”, *Atmos. Meas. Tech.*, 4, 975-1018, doi:10.5194/amt-4-975-2011, 2011.

Preferred mode of presentation

Oral

Poster

Either

Topic (check all that apply)

Inversion algorithms - achievements and new ideas to derive aerosol, clouds and surface properties

Characterization of aerosol, clouds and surface

Modeling and inverse modeling of aerosol and clouds climatic effects

Measurement synergy approaches

*In situ* observations and field campaigns

Upcoming and current satellite missions

Other: if checked, enter description here