Aerosol Characterisation in the Operational Context of EPS-SG/3MI

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The EPS-SG Multi-View, Multi-Channel, Multi-Polarisation Imaging mission (3MI) is a push-broom radiometer dedicated to aerosol characterisation for air quality, NWP, atmospheric composition, and climate monitoring. 3MI will provide multi-spectral (from 410 to 2130 nm), multi-polarisation (three polarised acquisitions at +60°, 0°, and -60°), and multi-angular (14 views) images of the Earth TOA outgoing radiance in order to both accurately measure the aerosol load, by resolving the directional anisotropy, and to characterise the microphysical properties of the particles populating the atmosphere. It is scheduled for launch late 2025 [1].

The high information content, consequence of the multi-spectral, multi-polarisation and multi-angular characteristics of 3MI [2], in combination with a tailored version of the GRASP (Generalized Retrieval of Aerosol and Surface Properties [3]) algorithm will allow the retrieval of aerosol properties with a very high accuracy and satisfying the Near-Real-Time requirements. For 3MI the priority is the retrieval of the aerosol optical depth and aerosol type. When the information content is sufficient, a suite of additional parameters can be also derived such as fine/coarse fraction, single scattering absorption, refractive index, aerosol layer height, angstrom exponent....

This presentation will focus on the last improvements proposed in the GRASP retrieval and its encapsulation into a processor in order to better meet the requirements for NRT users. This includes the consideration of aerosol model & component, the provision of an error calculation at pixel level [4], or the optimization for NRT processing. The Cal/Val analysis is an important asset to evaluate the performance, detect anomalies, and improve the retrieval. Examples will be based on the PARASOL polarimetric data. The overall aerosol processor, encapsulating the GRASP retrieval, will be presented. The aerosol product, still under consolidation, is being optimised and tailored for the need of NRT users.

References

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