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Synergetic retrieval of aerosol properties from MetOp

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At the Earth Observation Center (EOC) of the German Aerospace Center (DLR) an upgrade of the synergetic aerosol retrieval method SYNAER which exploits GOME-2 and AVHRR data was made. SYNAER combines the use of an automatic dark field technique for AVHRR visible reflectances with a least square fit of simulated radiance spectra to GOME-2 measurements in order to retrieve aerosol optical depth and type in the boundary layer. This combination of two instruments allows retrieving aerosol optical depth at 550 nm and aerosol speciation from a choice of 40 pre-defined aerosol types.
This method was firstly developed with the sensor pairs ATSR-2 & GOME on board ERS-2 and AATSR & SCIAMACHY on board ENVISAT. However, due to instrumental limitations the coverage of SYNAER/ERS-2 and SYNAER/ENVISAT is very sparse. Therefore, SYNAER was transferred to similar sensors AVHRR and GOME-2 onboard MetOp. While transferring to the new sensor pair a thorough evaluation of the synergetic methodology and its information content has been conducted, which led to significant improvements in the methodology.
The first goal is the production of a 1-year tropospheric aerosol dataset and its thorough error characterization as input to Aerosol_CCI, MACC and PASODOBLE projects. The work shows exemplary results obtained with SYNAER applied to METOP sensors.