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# Aerosol retrieval algorithm for MERIS: Description of concept and presenting results

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The Medium Resolution Imaging Spectrometer (MERIS) has been launched in 2002 onboard the ESA Envisat satellite and was providing data until Envisat's end in 2012. The MERIS spectrometer was designed primarily for surface and land scientific applications and measured reflected solar radiation in 15 channels from 400-900nm. Based on the work of Sayer and Hsu for SeaWiFS, an aerosol retrieval for MERIS was developed as part of the ESA Aerosol_cci project. The high spectral resolution of the instrument provides capability for retrieving aerosols. The algorithm can be transferred also to the OLCI measurements operating onboard the Sentinel-3 satellites since 2015.
The retrieval code uses a Look-Up-Table (LUT) approach to speed up the calculations. The LUTs are calculated with the radiative transfer code LibRadtran (Meyer und Kylling, 2005). In minimizing the differences of satellite measurements with forward simulations, with Levenberg-Marquardt as the mathematical approach, the aerosol loading of the satellite measurement is inferred. As basis for the algorithm, a MERIS new cloud detection system (exploiting blue to near infrared channels) was defined, as well as a 16-day moving average surface albedo database.
The presentation will describe the general concept of the retrieval algorithm and show results of aerosol properties retrieved from the MERIS measurements. An information content analysis is used to assess the general capability of retrieving aerosol optical depth (AOD) from the MERIS channels. Challenges concerning the retrieval algorithm and its input data will be discussed. Comparisons with external datasets will be given, either for the cloud mask, the surface database as well as the final AOD product. Results of the aerosol product will be presented together with a discussion on its quality triggered by validation with AERONET measurements.

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