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Retrieval of aerosol parameters over land surfaces using MERIS

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The correct retrieval of spectral properties of land surface types of MERIS imagery requires the correction of the temporal and spatial atmospheric influences. The account for Rayleigh scattering is easy, considering the wavelength dependent molecular scattering properties and the surface elevation. However, the aerosol optical thickness depends on aerosol type and concentration and is variable in time and space. This requires the estimation of the spectral aerosol optical thickness over land surfaces.

The estimation of the aerosol optical thickness is made by the BAER approach (BAER - **B**remen **AE**rosol **R**etrieval), von Hoyningen-Huene et al., 2003). We find that the retrieved aerosol optical thickness obtained using MERIS and SeaWiFS L1 top-of-atmosphere radiances is well compared with ground-based observations performed by the global network of spectrophotometers (AERONET). The aerosol optical thickness over land surfaces is retrieved from 7 MERIS (respectively 6 SeaWiFS) channels in the spectral range 0.412 - 0.665 μm.

Results of aerosol retrievals and derived aerosol parameters over land surfaces will be presented. This allows to study the spatial variability of atmospheric aerosol.

Angström spectral slope parameter α is derived from the the spectral atmospheric optical thickness. Assuming monomodal logarithmic aerosol size distribution model, higher level aerosol parameters, like effective radius, number concentration and mass concentration can be estimated for different atmospheric processes and aerosol situations.

Reference

von Hoyningen-Huene, W., Freitag, M., Burrows, J.P.: Retrieval of Aerosol Optical Thickness over Land Surfaces from Top-of-Atmosphere Radiance, JGR 108 (2003) D9 4269.