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Retrieval of spectral aerosol optical thickness for atmospheric correction of MERIS land surface products

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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 influence. The consideration of Rayleigh scattering is principally easy made, considering the wavelength dependent scattering properties and the surface elevation. However the aerosol optical thickness depends on aerosol type and concentration and is variable in time space. This requires the estimation of spectral aerosol optical thickness over land surfaces.

The estimation of aerosol optical thickness is made by the BAER approach (BAER - **B**remen **AE**rosol **R**etrieval), von Hoyningen-Huene et al., 2003. Using MERIS L1 top-of-atmosphere radiance comparable results for the aerosol optical thickness with ground-based observation and co-located SeaWiFS over-flights are obtained. The aerosol optical thickness over land surfaces is obtained from 7 MERIS channels in the spectral range 0.412 - 0.665 μm. The values for larger wavelength have to be extrapolated, using an Angström power law fitted from the retrieved results.

Using the estimated aerosol optical thickness the aerosol reflectance for all MERIS channels can be determined and the atmospheric correction for the land surface targets can be performed.

Results of aerosol retrievals and atmosphere corrected surface reflectance spectra will be presented, enabling as well aerosol studies as further investigations of land surface

characteristics. The approach is prepared now for the application of MERIS L2 reflectance data to complete the incomplete atmospheric correction of this data product over land surfaces.

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.