XBAER: A versatile algorithm for the retrieval of aerosol optical thickness from satellite observations

Linlu Mei, Vladimir Rozanov, Marco Vountas, John Burrows, and Soheila Jafariserajehlou
University Bremen, Institute of Environmental Physics, Bremen, Germany (mei@iup.physik.uni-bremen.de)

A new Aerosol Optical Thickness (AOT) retrieval algorithm for Medium Resolution Imaging Spectrometer (MERIS) and similar instruments over land and ocean surfaces, referred to as eXtensible Bremen AErosol Retrieval (XBAER), has been successfully developed recently. A standalone cloud screening algorithm minimizes cloud contamination for aerosol retrieval in XBAER. XBAER algorithm has a generic surface parameterization for land and ocean. Instead of a global parameterization of surface spectral reflectance, XBAER uses a set of spectral coefficients to prescribe surface properties. In this manner, XBAER is not limited to dark surfaces (ocean, vegetation) and retrieves AOT over bright surface (desert, semiarid, and urban areas). XBAER uses MODIS Dark-Target assumptions and the expected aerosol type for a given region and season based on the analysis of Aerosol Robotic Network (AERONET) and Maritime Aerosol Network (MAN) observations for both land and ocean. All above three steps allow XBAER to retrieve AOT over different surface types by a harmonized and generic retrieval algorithm. XBAER will extend its retrieval coverage to snow/ice surfaces under the support of "Arctic Amplification: Climate Relevant Atmospheric an SurfaCe Processes and Feedback Mechanisms (AC)3" project.