
Aerosol retrieval over ocean from DPC-2/GF-5(02) using RemoTAP extended with a 3-parameter ocean bio-optical model

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Abstract: Multi-angle polarimetric instruments (MAPs) enable the retrieval of essential aerosol properties over oceanic regions. MAPs retrieval algorithms commonly use a 1-parameter ocean bio-optical model (OBM), which is based on chlorophyll-a concentration only to represent optical properties over open waters (case-1), whereas the coastal water (mixture of case-1 and case-2 waters) representation generally requires multi-parameter models. In this work, the Remote Sensing of Trace Gases and Aerosol Products (RemoTAP) algorithm, developed by the Space Research Organization Netherlands (SRON), is extended by incorporating a 3-parameter OBM to represent coastal waters. The three parameters are chlorophyll-a concentration, backscattering coefficient of particulate matter at 660 nm, and the absorption coefficient of non-algal particles (NAP) and colored dissolved organic matter (CDOM) at 440 nm. We applied the extended algorithm for aerosol retrieval from synthetic and real observations of the second-generation Directional Polarization Camera (DPC-2), and compared with retrievals based on the 1-parameter OBM. The most important finding from this work is that a simple open ocean one-parameter OBM together with fitting a spectral-depend Lambertian correction term provides sufficient accuracy for global aerosol retrieval, even over coastal water

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