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Simultaneous retrieval of aerosol optical properties and ocean color based on the optimal estimation approach

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A flexible inversion algorithm is proposed for simultaneously retrieving aerosol optical properties and water-leaving radiance from multispectral instrument over the ocean. In this algorithm, forward radiation calculation is performed by a coupled atmosphere-ocean radiative transfer model combined with a comprehensive bio-optical ocean module. A combined multi-wavelength and multi-pixel constraint approach is used to estimate aerosol and hydrosol over clear and turbid waters. This sort of simultaneous inversion helps to correct the biases induced by the neglect of water-leaving radiance in the traditional aerosol retrieval algorithms, in addition, it can provide more aerosol information than the standard ocean color approach. To investigate the availability of current scheme, we conduct the retrieval in the process of MODIS, GOSAT/CAI and GCOM-C/SGLI instruments. Some results and comparison, as well as the validation with AERONET-OC, are discussed.