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Aerosol component concentration derived by the GRASP algorithm from multi-angular polarimetric satellite observations

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Recently, a novel methodology for retrieval of aerosol components from multi-angular polarimetric satellite observations has been developed, which is realized within the GRASP (Generalized Retrieval of Aerosol and Surface Properties) algorithm. The conceptual specific of the GRASP/Component approach is in direct retrieval of aerosol speciation (component fraction) without intermediate retrievals of aerosol optical characteristics. In this presentation, we will show the spatial and temporal variabilities of the aerosol component retrievals (including black carbon, brown carbon, minearl dust, etc.) and aerosol optical properties derived by the GRASP/Component approach from POLDER/PARASOL and DPC/GF-5 multi-angular polarimetric measurements. The aerosol components obtained in addition to the aerosol optical properties provides additional valuable, qualitatively new inside about aerosol distributions and, therefore, demonstrates advantages of multi-angular polarimetric satellite observations as the next frontier for aerosol inversion from advanced satellite observations. The extensive satellite-based aerosol component dataset is expected to be useful for improving global aerosol emissions and component-resolved radiative forcing estimations.

Keywords: aerosol component, multi-angular polarimetric measurements, GRASP, POLDER-3, DPC/GF-5