Optimisation of advanced Near Real Time retrieval of aerosol properties from multi-angular polarimetric observations using GRASP algorithm

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The GRASP algorithm [1,2] employs a multi-pixel approach that is not optimal for near real time (NRT) retrievals. This study aims to improve the accuracy/speed ratio of the aerosol retrievals from multi-angular multi-wavelength polarimetric observations by optimizing the GRASP multi-pixel approach. Our objective is to explore the possibility of modifying the GRASP NRT approach to incorporate a priori information on the variability of land surface reflectance and its actual values. We also consider other factors such as optimal aerosol representation, the number of consecutive cloud-free days of observations treated during the inversion, and optimization of radiative transfer calculations to analyze their impact on the speed and quality of the retrievals. Our analysis is based on an extensive dataset of real POLDER observations from 19 representative AERONET sites and several extended geographical zones. We validate the time variability of the retrievals against AERONET observations and compare the spatial distribution of the retrievals with archived POLDER/GRASP products [3].
The findings and outcomes of the study are planned to be used in operational retrievals of the EUMETSAT 3MI [4] mission.

Keywords: 3MI, GRASP, POLDER, retrieval algorithm, aerosol, near real time retrievals

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