



Characterization of aerosol properties from polarimetric satellite observations using GRASP algorithm

Oleg Dubovik, Pavel Litvinov, Tatyana Lapyonok, Fabrice Ducos, Xin Huang, Anton Lopatin, David Fuertes, and Yevgeny Derimian

Laboratoire d'Optique Atmospherique, CNRS, Universite de Lille -1, Villeneuve d'Ascq, France
(oleg.dubovik@univ-lille1.fr)

GRASP (Generalized Retrieval of Aerosol and Surface Properties) is recently developed (Dubovik et al. 2011, 2014) sophisticated algorithm of new generation. The algorithm retrieves aerosol and surface properties simultaneously. It realizes statistically optimized fitting using multi-pixel concept when the retrieval is implemented simultaneously for a large group of satellite pixels. This allows for using additional a priori information about limited variability of aerosol of surface properties in time and/or space. GPASP searches in continuous space of solutions and doesn't utilize look-up-tables. GRASP doesn't use any location specific information about aerosol or surface type in the each observed pixel, and the results are essentially driven by observations. However GRASP retrieval takes longer computational time compare to most conventional algorithms. This main practical challenge of employing GRASP has been addressed during last two years and GRASP algorithm has been significantly optimized and adapted to operational needs. As a result of this optimization and GRASP has been accelerated to the level acceptable for processing large volumes of satellite observations. Recently GRASP has been applied to multi-years archives of PARASO/POLDER. The analysis of the results shows that GRASP retrievals provide rather robust and comprehensive aerosol characterization including such properties as absorption and aerosol type even for observations over bright surfaces and for monitoring very high aerosol loading events (with AOD up to 3 or 4). In addition, the attempts to estimate such aerosol characteristics as aerosol height, air quality, radiative forcing, etc. have been made. The results and illustrations will be presented.