



Aerosol products generated by GRASP algorithm from PARASOL and MERIS/Envisat satellite observations

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The presentation discusses aerosol satellite products produced by the recently developed algorithm of new generation GRASP (Dubovik et al. 2011, 2014). GRASP is complex algorithm realized as open source software (<http://www.grasp-open.com/>). It is applicable both to satellite and ground-based observations. The particularity of GRASP is that it allows for implementing advanced retrieval scenarios. In most of application GRASP doesn't utilize look-up-tables and searches in continuous space. In all applications GRASP realizes rigorous statistically optimized fitting based on multi-term LSM approach (Dubovik 2004) that includes several original features. For example, GRASP satellite retrieval is based on multi-pixel concept when the optimized retrieval is implemented simultaneously for a large group of measurements, such as a group of satellite pixels or a group of coordinated ground-based observations. This approach helps to use additional a priori information about limited variability of aerosol of surface properties in time and/or space that stabilize the retrieval. In addition, GRASP generates several radiatively consistent products by retrieving both aerosol and underlying surface properties simultaneously from satellite observations using the same retrieval assumptions globally. As a result, GRASP provides reliable retrieval of some detailed aerosol properties that are traditionally difficult to obtain from remote sensing. For example, from the observations of PARASOL polarimeter GRASP retrieves not only spectrally dependent aerosol optical thickness and also spectra aerosol absorption over both ocean dark and land reflective surfaces and even some information about aerosol vertical distribution. Also, the basic aerosol retrieved parameters as aerosol optical thickness and its spectral dependence are expected to be retrieved with the enhanced accuracy. The climatological results of retrievals from two rather different satellite missions: PARASOL and MERIS/Envisat will be presented. The quality of the retrieval and comprehensive validation of the results against AERONET data will be shown.