



## **SEOM's Sentinel-3/OLCI' project CAWA: advanced GRASP aerosol retrieval**

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The CAWA “Advanced Clouds, Aerosols and Water vapour products for Sentinel-3/OLCI” ESA-SEOM project aims on the development of advanced atmospheric retrieval algorithms for the Sentinel-3/OLCI mission, and is prepared using Envisat/MERIS and Aqua/MODIS datasets. This presentation discusses mainly CAWA aerosol product developments and results. CAWA aerosol retrieval uses recently developed GRASP algorithm (Generalized Retrieval of Aerosol and Surface Properties) algorithm described by Dubovik et al. (2014). GRASP derives extended set of atmospheric parameters using multi-pixel concept - a simultaneous fitting of a large group of pixels under additional a priori constraints limiting the time variability of surface properties and spatial variability of aerosol properties. Over land GRASP simultaneously retrieves properties of both aerosol and underlying surface even over bright surfaces. GRASP doesn't use traditional look-up-tables and performs retrieval as search in continuous space of solution. All radiative transfer calculations are performed as part of the retrieval.

The results of comprehensive sensitivity tests, as well as results obtained from real Envisat/MERIS data will be presented. The tests analyze various aspects of aerosol and surface reflectance retrieval accuracy. In addition, the possibilities of retrieval improvement by means of implementing synergetic inversion of a combination of OLCI data with observations by SLSTR are explored. Both the results of numerical tests, as well as the results of processing several years of Envisat/MERIS data illustrate demonstrate reliable retrieval of AOD (Aerosol Optical Depth) and surface BRDF. Observed retrieval issues and advancements will be discussed. For example, for some situations we illustrate possibilities of retrieving aerosol absorption – property that hardly accessible from satellite observations with no multi-angular and polarimetric capabilities.