

## Advanced surface/atmosphere characterization using GRASP: new possibilities and challenges

Pavel Litvinov (1), Oleg Dubovik (2), Tatsiana Lapionak (2), Xin Xuang (1), Anton Lopatin (1), David Fuertes (1), Benjamin Torres (1), Yevgeny Derimian (2), Fabrice Ducos (2), Michael Aspetsberger (3), Andreas Hangler (3), Georg Ogris (3), and Christian Federspiel (3)

(1) GRASP-SAS, Generalized Retrieval of Atmosphere and Surface Properties, Villeneuve d'Ascq CEDEX, France (pavel.litvinov@grasp-sas.com), (2) Laboratoire d'Optique Atmosphérique, CNRS, Université Lille-1, France, (3) Catalysts GmbH, Huemerstraße 23, A-4020 Linz, Austria

Aerosol and surface characterization from space-borne remote sensing are closely related topics. Accurate aerosol retrieval is impossible without accurate surface reflection knowledge and vice versa. Therefore, nowadays simultaneous treatment of both problems is considered as powerful tool for advanced surface/ atmosphere characterization and monitoring.

Recently developed GRASP (Generalized Retrieval of Aerosol and Surface Properties) approach has offered new possibilities for complete and accurate retrieval of aerosol and surface. GRASP is based on statistically optimized inversion combined with the use of advanced forward models of aerosol and surface scattering. The practical efficiency of GRASP has already been demonstrated for the space-borne instruments of moderate and coarse spatial resolution (PARASOL, MERIS, GOCI etc.).

The extended characterization of aerosol and surface with GRASP provides new possibilities for comprehensive investigation of Earth atmosphere and surface. At the same time it provides additional details for rising new open questions on different aspects of aerosol and surface modelling, global distribution and mutual interrelations.

In this presentation, using GRASP retrieval from multi-angle photopolarimetric PARASOL measurements, we discuss possibilities and challenges of aerosol/surface classification in multi-dimensional space of retrieved parameters. On the basis of new-found intrinsic relations between the surface and aerosol properties the global distribution of aerosol sources and extended aerosol/surface climatology from GRASP/PARASOL will be analyzed.