The GRASP cloud – application and demonstration

Michael Aspetsberger[a,*], Stefan Amberger[a], Petrut Cobarzan[a], Lukas Bindreiter[a], Andreas Hangler[a], Verena Lanzinger[a], Daniel Marth[a], Moritz Wanzenböck[a], Oleg Dubovik[b], Tatyana Lapyonok[b], Benjamin Torres[b], David Fuertes[c], Pavel Litvinov[c], Anton Lopatin[c], Cheng Chen[c], Yana Karol[c], Itaru Sano[d], and Sonoyo Mukai[d]

[a]*Catalysts GmbH, Huemerstraße 23, A-4020 Linz, Austria*
[b]*Laboratoire d'Optique Atmosphérique, CNRS/Université Lille, Villeneuve d'Ascq, France*
[c]*GRASP SAS, Impasse de l'Eglise 20, Bachy, 59830, France*
[d]*Department of Informatics, Kindai University, Osaka, Japan*

[*]*Presenting author (michael.aspetsberger@catalysts.cc)*

Earth-observing satellites keep a watchful eye on our planet, 24 hours, 7 days a week. The data volume they collect grows steadily and can reach significant quantities. All that data, however, would have little value when left unprocessed. The true value is only revealed when applying sophisticated, innovative algorithms.

The Generalized Retrieval of Aerosol and Surface Properties (GRASP) algorithm [1,2] is capable of deriving an extended set of aerosol and surface parameters. A key benefit is its high versatility, allowing it not only to be applicable to multi-angular polarimetric observations, but also to single-view intensity only observations, from sun-synchronous to geostationary platforms. Specifically, it uses the new multi-pixel concept – a simultaneous fitting of a large group of pixels with additional constraints limiting the time variability of surface properties and spatial variability of aerosol properties. This principle provides a possibility to improve the retrieval from multiple observations – e.g., polarimetric and intensity only – even if the observations are not exactly co-incident or co-located.

In recent years, several new satellite missions have been or are about to be launched that are capable of a retrieval with GRASP. In an effort to accelerate the application of GRASP, we present the concept of a cloud of computing resources, the GRASP Cloud. This cloud is not limited to space-borne observations only, but also capable of handling ground-based or in-situ measurements. Being jointly developed by several groups, first successful applications include PARASOL/POLDER, ENVISAT/MERIS, Sentinel-3/OLCI, Terra/MISR, and GCOM-C/SGLI. We will demonstrate the processing and storage capacities, show how new instruments can be integrated, and how to combine and interact with the results for validation and calibration studies.

References

[1] Dubovik, O., T. Lapyonok, P. Litvinov, *et al.*, 2014: GRASP: a versatile algorithm for characterizing the atmosphere. *SPIE Newsroom*. DOI:10.1117/2.1201408.005558, http://spie.org/x109993.xml

[2] Dubovik, O., M. Herman, A. Holdak, *et al.*, 2011: Statistically optimized inversion algorithm for enhanced retrieval of aerosol properties from spectral multi-angle polarimetric satellite observations. *Atmos. Meas. Tech*. **4**, 975–1018.

Preferred mode of presentation: Oral