Geophysical Research Abstracts
Vol. 13, EGU2011-10041, 2011
EGU General Assembly 2011

Global retrieval of long-term aerosol datasets from ERS-2, ENVISAT and Sentinel-3

Peter North (1), Suzanne Bevan (1), William Grey (1), Andreas Heckel (1), Carsten Brockmann (2), Juergen Fischer (3), Luis Gomez-chova (4), Rene Preusker (3), and Peter Regner (5)

(1) Dept. of Geography, Swansea University, Swansea, UK (p.r.j.north@swansea.ac.uk), (2) Brockmann Consult, Geesthacht, Germany, (3) Freie Universität Berlin, Berlin, Germany, (4) Universitat de Valencia, Valencia, Spain, (5) ESA/ESRIN, Via Galileo Galilei, Frascati (Rm) 00044, Italy

We present results of global aerosol retrieval from the ESA ATSR instrument series on ERS-2 and ENVISAT (1995-2010), and initial testing of a new algorithm developed for Sentinel-3, with planned operation 2014-2030. The ATSR instruments on ERS-2 and ENVISAT together provide one of the longest available, well-calibrated datasets of satellite radiance measurements. The dual-angle viewing capability gives two near-simultaneous images at differing slant paths though the atmosphere, allowing global retrieval of aerosol optical thickness without assumptions on surface spectral properties. We present the global ATSR time series and analysis of trends, and give comparison with AERONET and with MODIS and MISR global datasets. The algorithm has been developed for application to Sentinel-3 to make use of synergistic retrieval from two sensors, OLCI and SLSTR. The research explores the gain by using information from both instruments simultaneously to constrain atmospheric profile, characterise cloud, and provide improved atmospheric correction to surface reflectance. The algorithm has been implemented on the ESA BEAM system and tested on MERIS and AATSR data, and compared with existing algorithms. Preliminary results show agreement with AERONET to optical thickness of 0.04 mean absolute error at 550nm, and suggest improved estimation of aerosol properties compared to single-instrument retrievals.

References

Bevan, S.L., North, P.R.J., Grey, W.M.F., Los, S.O. and Plummer, S.E. (2009). Impact of atmospheric aerosol from biomass burning on Amazon dry-season drought. Journal of Geophysical Research, 114, D09204, doi:10.1029/2008JD011112.

Bevan, S.L., et al. (2010). A global dataset of atmospheric aerosol optical depth and surface reflectance from AATSR, Remote Sensing of Environment, submitted.

North, P.R.J. et al. (2010) Sentinel-3 L2 Products and Algorithm Definition: OLCI/SLSTR Level 2 and 3 Synergy Products, S3-L203S2-SU-ATBD.