Geophysical Research Abstracts, Vol. 9, 03985, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-03985

Simultaneous retrieval of aerosol load and surface reflectance using MSG/SEVIRI observations

S. Wagner (1), Y. Govaerts (2), A. Lattanzio (3) and P. Watts (2)

(1) Consultant, Darmstadt, Germany, (2) EUMETSAT, Darmstadt, Germany, (3) Makalumedia, Darmstadt, Germany (sebastien.wagner@eumetsat.int / Phone: +49 6151 807 7344)

Earth observation satellites are playing a key role for better understanding atmospheric processes, and for improving the numerical modelling of these processes. Thanks to an increasing spatial and temporal resolution, geostationary meteorological satellites such as MSG/SEVIRI are a precious source of continuous and detailed measurements at the scale of continents. Space-borne radiometers provide multi-angular and/or multi-spectral measurements that can be used for retrieving information on both the atmosphere and its composition, and the Earth surface.

In this context, the presented new Land Daily Aerosol algorithm developed at EUMETSAT aims at giving more insight to the interaction between aerosol detection and surface characterization. Its purpose is to derive the mean daily tropospheric aerosol load from observations acquired by the SEVIRI radiometer on-board the Meteosat Second Generation satellites. The aerosol load is calculated through the optical depth parameter, for various types of aerosols over land surfaces, and is inferred from the inversion of a forward radiative transfer model against daily accumulated observations in the 0.6, 0.8 and 1.6 SEVIRI bands. These daily time series provide the angular sampling used to discriminate the radiative effects that result from the surface anisotropy, from those caused by the aerosol scattering. The algorithm, based on the Optimal Estimation theory, retrieves simultaneously the surface bidirectional reflectance, and the aerosol optical thickness for various types of aerosols. To validate the modelling approach and the algorithm that resolves the inversion problem, results of comparisons with AERONET data are presented, together with their linear error analysis. The effects of updating in time the prior information on the retrieval quality are also analysed.