



Global dust infrared aerosol properties retrieved using hyperspectral sounders

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Observations from infrared hyperspectral sounders, here IASI and AIRS, are interpreted in terms of dust aerosol properties (AOD and mean altitude). The method is based on a "Look-Up-Table" (LUT) approach, where all radiative transfer computation is performed once for all and "off-line", for a large selection of atmospheric situations, of observing conditions, of surface characteristics (in particular the surface emissivity and temperature), and different aerosol refractive index models. The inversion scheme follows two main steps: first, determination of the observed atmospheric thermodynamic situation, second, simultaneous retrieval of the $10\mu\text{m}$ coarse-mode AOD and of the mean altitude. The method is here applied over sea and over land, at daily scale daytime and nighttime, and at the satellite pixel resolution (12 km at nadir).

The geographical study area studied includes the northern tropics from west Atlantic to the Arabian peninsula and Indian ocean, and the Mediterranean basin, all of them characterized by strong, regular dust events. A special focus is given to the hourly variation of aerosol properties within a day. In this context, both IASI overpasses are processed, providing two measurements at 9:30AM and 9:30PM (equator local time) each day. First results obtained from AIRS observations, made at 1:30 AM and PM, open the way to the analysis of the aerosol diurnal cycle.

For the AOD, comparisons are made with AERONET ground-based data, when available, in order to 1) evaluate our results, and 2) show the importance of a better knowledge of the aerosol diurnal cycle, especially close to the sources. Mean aerosol layer altitude obtained from IASI is compared at local scale with the Cloud-Aerosol Lidar with Orthogonal Polarization (CALIOP/CALIPSO) aerosol altitude.