

RETRIEVING DUST AEROSOL PROPERTIES FROM SPACE USING AIRS DATA

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We show that the recently launched Advanced InfraRed Sounder (AIRS), with its high spectral resolution (about 1cm-1), is able to retrieve both the optical depth and the altitude of dust aerosols over ocean. Simulation of AIRS observations for aerosol-loaded atmospheric situations have been carried out using a radiative transfer code coupling a line-by-line model (Automatized Atmospheric Absorption Atlas : 4A) and a discrete ordinate method (DISORT) to account for scattering. These simulations show that the difference in brightness temperature between a clear and an aerosol-loaded situation may reach 10 K for some channels. This effect increases with the aerosol optical depth and altitude of the layer. As these variations depend on the channel considered, both the altitude and the optical depth of the aerosol layer may be retrieved, using a well-chosen subset of ten channels and pre-computed Look-up-Tables. Retrievals from AIRS observations for a few month period (April - August 2003) are presented. Validations using MODIS, Aeronet and/or the Geoscience Laser Altimeter System (GLAS) measurements are in progress. Further studies are being undertaken to retrieve separately dust loading and aerosol spectral infrared optical depths. Through the study of the variations of spectral infrared optical depths, we should improve our knowledge of the spectroscopy and chemical composition of the dust aerosol.