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Aerosol optical properties retrieval from visible and infrared: sensitivity analisys.

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A sensitivity analysis of a radiative transfer model for the retrieval of aerosol properties from satellite measurements will be presented. The model includes both visible and infrared components and will be used in conjunction with the SEVIRI (Spinning Enhanced Visible and Infra-red Imager) instrument on board of Meteosat Second Generation. This work is based on the ORAC aerosol retreival algorithm, developed at Oxford University and Rutherford Appleton Laboratories for the visible and near infrared channels, with the extension to the two SEVIRI infrared channels centered at 10.8 and 12.1 micron. The forward model values of atmospheric scattering, absorption and emission are calculated by DISORT (DIScrete Ordinate Radiative Transfer) radiative tranfer code. The forward model uses an aerosol database of macrophysical optical properties computed from published aerosol micophysical properties. The aerosol parameters we retrieve are: aerosol optical depth (at 550nm) and effective radius. We show that the IR channels are sensitive to the scattering and absorption of aerosol characterized from a significant percentage of coarse particles. This information is of particular interest when monitoring aerosol events, such as desert dust or a volcanic eruption. This application to SEVIRI is particually interesting as it enables us to follow the aerosols evolution in time.