Geophysical Research Abstracts
Vol. 12, EGU2010-8414, 2010
EGU General Assembly 2010

Particle shapes and 3D effect in Monte Carlo radiative transfer simulations in dust plumes

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Dust identification over land from the solar SEVIRI channels on the MSG satellite is difficult due to low contrast between dust and surface optical properties.
To improve that, the 3D Monte Carlo radiative transfer model (MC-UniK) is applied to the output of the Eulerian chemistry-transport-model LM-MUSCAT-DES, which simulates the Transport of dust plumes.
Optical properties of dust particles are taken from in-situ observations from the first phase of the SAMUM project and from calculations for spherical, spheroidal and crystal particle shapes.
To make scattering properties handable, scattering classes were introduced. In the main scattering classes is e.g. the difference between spherical and spheroidal shapes for the single scattering albedo up to 5 % at 0.8 μm.
Also the influence of the particle shape and the effect of horizontal photon transport on radiation fields is discussed.