Geophysical Research Abstracts,
Vol. 11, EGU2009-10897, 2009
EGU General Assembly 2009

Cloud property profiles from passive spectral imaging

T. Zinner (1), B. Mayer (1), A. Marshak (2), J.V. Martins (2,3)

(1) Deutsches Zentrum f. Luft und Raumfahrt, Oberpfaffenhofen, Germany (tobias.zinner@dlr.de), (2) NASA Goddard Space Flight Center, Greenbelt, Maryland, USA, (3) Department of Physics and Joint Center for Earth Systems Technology, University of Maryland, Baltimore, Maryland, USA

Insights into the microphysics of clouds, the formation of droplets, and their vertical profile are crucial to understand the onset of precipitation or aerosol effects. In-situ measurements are limited in their temporal and spatial extent and applied mainly to shallow types of clouds. Satellite measurements from passive sensors are concentrating on cloud tops while vertical profiles of precipitation size drops are retrieved from radar measurements by CloudSat. Also ground-based radar systems often concentrate on precipitation or vertical observations. These data still leave a gap, especially in our understanding of the development of convective clouds where in-situ data is sparse and remote measurements difficult to interpret.

We propose a new cloud spectrometer system for the ground-based (mountains or roof-tops) and air-borne observation of clouds - a passive imager observing cloud sides under a slanted persepctive at wavelengths from the visible through the near-infared into the thermal infra-red. A study shows the potential to derive profiles of cloud properties (cloud phase, particle size and optical depth) near the cloud edges on a high spatial resolution using a statistical retrieval approach accounting for 3D radiative transport effects.