



Convective dynamics and aerosol-cloud interactions

L. Donner, Y. Ming, C. Golaz

GFDL/NOAA, Princeton University, Princeton, NJ 08540 USA [leo.j.donner@noaa.gov]

A central aspect of interactions between clouds and aerosols is the degree to which aerosols become activated as liquid droplets. The dominant control for aerosols of specified composition and size is supersaturation, which is determined primarily by local cooling rates and, by implication, vertical velocities. Convective vertical velocities thus play an important role in cloud-aerosol interactions. This presentation will focus on the representation of convective vertical velocities in an atmospheric general circulation model and the subsequent impacts on cloud-aerosol interactions and the microphysical and radiative properties of clouds. The results show incorporating indirect effects in climate models requires sufficiently accurate parameterizations for both aerosol activation and the driving dynamics in both convective and stratiform clouds.