Geophysical Research Abstracts
Vol. 16, EGU2014-1668, 2014
EGU General Assembly 2014


# Impact of Aerosols on Convective Clouds and Precipitation

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Aerosols are a critical factor in the atmospheric hydrological cycle and radiation budget. As a major agent for clouds to form and a significant attenuator of solar radiation, aerosols affect climate in several ways. Current research suggests that aerosols have a major impact on the dynamics, microphysics, and electrification properties of continental mixed-phase convective clouds. In addition, high aerosol concentrations in urban environments could affect precipitation variability by providing a significant source of cloud condensation nuclei (CCN). Such pollution effects on precipitation potentially have enormous climatic consequences both in terms of feedbacks involving the land surface via rainfall as well as the surface energy budget and changes in latent heat input to the atmosphere.

In this presentation, we will present the modeling results for three different convective cases, two over land (over Africa and one over central US) and one over ocean (west Pacific). Specifically, this modeling paper will examine the physical processes (latent heating release, cool pool dynamic and ice processes) that determine the invigoration of convection and enhancement of surface rainfall due to increase of CCN concentration.