1086-86-2393 **Guang Zhang*** (gzhang@ucsd.edu), 9500 Gilman Dr., La Jolla, CA 92093-0221, and **Xiaoliang Song**, 9500 Gilman Dr., La Jolla, CA 92093-0221. *Convection Microphysics and its Interaction with Aerosols and Climate in a Global Climate Model.*

A physically-based two-moment microphysics parameterization scheme for convective clouds is developed and evaluated in the National Center for Atmospheric Research (NCAR) Community Atmosphere Model CAM5 to improve the representation of convective clouds and their interaction with large-scale clouds and aerosols. The scheme is linked to aerosols through cloud droplet activation and ice nucleation processes, and to large-scale cloud parameterization through convective detrainment of cloud liquid/ice water content and droplet/crystal number concentration. A multi-year simulation with the new convective microphysics scheme shows that both cloud liquid/ice water content and droplet/crystal number concentrations are in good agreement with observations. Moreover, the microphysics scheme is able to represent the aerosol effects on convective clouds such as the suppression of warm rain formation and enhancement of freezing when aerosol loading is increased. Implications of aerosol-convection interaction on climate change will be discussed in the presentation. (Received September 25, 2012)