



Sensitivity of cloud microphysical properties and precipitation to nucleation processes in tropical convective cloud systems during KWAJEX

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This paper discusses potential impacts of aerosols and nucleation processes on cloud microphysical properties and precipitation of tropical convective clouds. Deep convection and accompanying cloud formation play an important role in radiative forcing of climate and hydrological cycle in the tropics. However, possible effects of anthropogenic aerosols on these clouds in days to monthly time scale are still not well understood. The case study chosen is KWAJEX campaign that took place from 23 July to 14 September 1999. Authors have developed a new microphysical scheme called Advanced Microphysical Prediction System to predict ice particle properties (such as size, particle density, and crystal habits) explicitly in a Cloud Resolving Model (Hashino and Tripoli, 2007). The model is set up for 2D simulation with periodic conditions over KWAJEX campaign area with synoptic forcing and run for weeks. First, the microphysical prediction is compared against aircraft microphysical observations and radar. Then, several vertical profiles of CCN and IN are input for the sensitivity tests. The links between the aerosols and nucleation processes, and resulting microphysical variables and precipitation will be discussed.