MEASURED AND MODELED INTERACTION BETWEEN CCN AND THE VERTICAL EVOLUTION OF CLOUD DROP SIZE DISTRIBUTION IN CONVECTIVE CLOUDS FOR ACRIDICON/CHUVA PROJECT

Numerical models are important tools for the study of the interaction between aerosols and clouds. Nevertheles, while Bin-resolving schemes are more comprehensive than bulk schemes, the computational cost associated with bin schemes is significantly higher than bulk schemes. Due to that, in most of the cases bin models are used to study the numerical representation of the nucleation process, the most important aspect of aerosol-cloud interaction.

In this work, we simulate the variability in cloud microphysics structure observed during the ACRIDICON/CHUVA Project the influence of aerosol load on the warm rain initiation. Simulations uses data collected During September-October 2014 using the Gulfstream-1 (G-1) aircraft of the Atmospheric Radiation Measurements (ARM), the ARM Aerial Facility (AAF).

We evaluate the ability of the model to represents the cloud droplet concentration as a function of vertical velocity. We also present a parameterization to the liquid water content (LWC) as a function of the effective radius. This parameterization can be straightforward applied to the cloud depth as a function of the effective radius.