

EGU2020-4420

<https://doi.org/10.5194/egusphere-egu2020-4420>

EGU General Assembly 2020

© Author(s) 2020. This work is distributed under the Creative Commons Attribution 4.0 License.



Numerical Simulations for the Warm Rain Properties during RICO with a Newly Developed Triple-moment Warm Cloud Scheme

Wei Deng

dengwei@mail.iap.ac.cn, Key Laboratory of Cloud-Precipitation Physics and Severe Storms, China (dengwei@mail.iap.ac.cn)

Double-moment schemes with a constant shape parameter cannot describe the condensation process and the collision coalescence processes properly. Evolutions of cloud droplet spectra and raindrop spectra simulated with different current bulk microphysical schemes also showed big differences. The newly developed triple-moment scheme (IAP-LACS scheme) considered the variation of the shape parameters of water drop distributions by means of the radar reflectivities of cloud droplets and raindrops, respectively, during the condensation process and collision-coalescence processes. In order to evaluate the performance of our new scheme, we use large-eddy simulation in WRF to research the precipitation formation in Rain in Cumulus over the Ocean (RICO) observation study with new triple-moment warm cloud scheme. This paper will show the simulation results for the microphysical characteristic, special for the evolution of warm raindrop size distribution in comparison with aircraft measurement. Our simulations show that our new triple-moment scheme can grasp the main characteristic of raindrop size distribution as observation and there must be difference existing in simulation results between new scheme and other microphysical bulk schemes.