



The role of cloud turbulence in warm rain initiation

L.-P. Wang (1) and W. W. Grabowski (2)

(1) University of Delaware, Newark, USA, (2) NCAR, Boulder, USA

A significant fraction of the precipitation that falls on Earth is formed by the collision-coalescence of cloud droplets, yet the rate of this process during the rain initiation stage is poorly understood. Recent studies have significantly advanced our understanding of the effects of in-cloud air turbulence on collisions between cloud droplets. Novel quantitative methods have also been developed to better describe the turbulent enhancement of the gravitational collision-coalescence. An impact study using the most realistic collection kernel suggests that cloud turbulence can resolve the discrepancy between the observed time for rain initiation in warm convective clouds and the predicted time based on the gravitational mechanism alone. This paper will review most recent developments in the area of the impact of cloud turbulence on warm rain initiation.