



A Study of Aerosol Impact on Summer Precipitation in Beijing: Case Simulation using WRF Model

Mengjiao Jiang (1), Xi Zhao (2), Lanning Wang (1), and Zhanqing Li (1)

(1) College of Global Change and Earth System Science, Beijing Normal University, Beijing, China

(mengjiaojiang05@gmail.com), (2) Department of Earth System Science, Tsinghua University, Beijing, China

(zhaoxi13@mails.tsinghua.edu.cn)

Cloud-Aerosol-Precipitation-Interactions are being increasingly accounted for in weather forecast as aerosols affect precipitation in the water and energy cycles. The WRF model was employed to simulate the impacts of aerosol on summer extreme precipitation over Beijing and surrounding areas in China. We conducted a suite of sensitivity tests with different microphysical schemes including constant droplet concentration and aerosol-aware microphysics. Hourly precipitation analysis data that merge observations at automatic weather stations with CMORPH were used to evaluate the simulated results. It shows that simulation with aerosol-aware microphysics better capture the precipitation pattern. Further analysis shows that aerosols tend to enhance summer heavy precipitation and influence the diurnal variation in precipitation. The results suggest that under heavy pollution conditions, considering aerosol impact on precipitation in a forecast model would improve the regional rainfall forecast accuracy.