

Application of Lightning Location and Radar Data in Cloud Analysis System and Numerical Experiments

*GUOQIANG XU¹, CHAN SUN²

1. National Meteorological Center of CMA, Beijing 100081, 2. Chinese Academy Meteorological Sciences of CMA, Beijing 100081

In this study, we analyze a strong convective activity occurred in Shanxi Province and Shandong Province of China in June 2016. Combined with Doppler weather radar three-dimensional mosaic reflectivity data and ADTD(Active Directory Topology Diagrammer) lightning location data, cloud microphysical variables (such as cloud water, cloud ice, etc.) in the initial field can be adjusted and analyzed by the Cloud Analysis System in GRAPES (Global/Regional Assimilation and Prediction Enhanced System). Based on this strong convective activity, three sets of experiments are designed. The results indicate that:(1) The cloud analysis system in GRAPES can more accurately analyze cloud microphysical variables in the initial field when the radar reflectivity data is used. (2) The lightning location data can complement radar reflectivity data, making the initial field closer to the real state of atmosphere. (3) From the perspective of precipitation, 6-h forecast of precipitation is improved when the radar reflectivity data is applied. For moderate and heavier rain, the application of lightning data can further improve the simulation.

Keywords: cloud analysis, radar reflectivity, lightning location