國立中央大學大氣物理研究所書報討論

Doppler Lidar and Mobile Radiosonde Observation-Based Evaluation of Warn-on-Forecast System Predicted Near-Supercell Environments during TORUS 2019

Abstract

The National Oceanic and Atmospheric Administration (NOAA) has developed the Warn-on-Forecast System (WoFS), a convection-allowing model (CAM) ensemble based on WRF. This article analyzes how the WoFS forecasts the feedback between the supercells and their near-storm environment, using data from the Targeted Observations with UAS and Radar of Supercells (TORUS) 2019 field campaign, which incorporated advanced technologies such as vertical pointing Doppler lidar. Lidar can observe time-varying vertical profiles of wind, generating a unique dataset that can be compared with WoFS kinematic predictions in rapidly evolving severe weather environments. Mobile radiosonde data are also presented to provide a thermodynamic comparison. The analysis shows that the WoFS accurately predicts the general kinematic trends of the inflow environment; however, the predictive feedback between the supercell and its environment is weaker than observed. Furthermore, WoFS forecasts over-predict convective available potential energy (CAPE), with CAPE errors inversely related to the distance from the storm.

Keywords:

Supercell、Convection Allowing Models (CAMs)

Reference:

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