Abstract

Severe local storms, including tornadoes, damaging hail and wind gusts, frequently occur over the eastern and northeastern states of India during the pre-monsoon season (March-May). Forecasting thunderstorms is one of the most difficult tasks in weather prediction, due to their rather small spatial and temporal extension and the inherent non-linearity of their dynamics and
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Physics. In this paper, sensitivity experiments are conducted with the WRF-NMM model to test the impact of convective parameterization schemes on simulating severe thunderstorms that occurred over Kolkata on 20 May 2006 and 21 May 2007 and validated the model results with observation. In addition, a simulation without convective parameterization scheme was performed for each case to determine if the model could simulate the convection explicitly. A statistical analysis based on mean absolute error, root mean square error and correlation coefficient is performed for comparisons between the simulated and observed data with different convective schemes. This study shows that the prediction of thunderstorm affected parameters is sensitive to convective schemes. The Grell-Devenyi cloud ensemble convective scheme is well simulated the thunderstorm activities in terms of time, intensity and the region of occurrence of the events as compared to other convective schemes and also explicit scheme.

Reference

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Applied Meteorology. 43 (1), 170–181
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Thunderstorm  
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