Prediction of heavy rainfall episode over South India using high resolution atmospheric model

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National Center for Atmospheric Research fifth generation Mesoscale Model (MM5) with nesting down to 10, 30 and 90-km grid spacing with different cumulus parameterization schemes (Grell, Betts-Miller, Anthes-Kuo and Kain-Fritsch (KF)-2) are used in the present study to compare simulated rainfall with observed values. As the Bay of Bengal is prone for formation of tropical cyclones, which eventually causes torrential rains and flash floods over east coast of India, prediction of above events reduces the livelihood and property damage. One such extreme rainfall event was occurred over South India due to severe cyclonic storm "JAL" during 5-9 November, 2010 is considered to predict the performance of cumulus parameterization schemes. Isolated extremely heavy rain (greater than 25 cms) occurred over Kanchipuram, Tiruvallur and Chennai districts of Tamil Nadu and South Coastal Andhra Pradesh, Rayalaseema and South Interior Karnataka during the same period. The spatial distribution of the model predicted rainfall showed good agreement with the satellite merged product and observed rainfall datasets. The correlation coefficients between the model predicted and observed rainfall at different selected stations shows correlation significant at 90% level. Finally the precipitation forecast is evaluated over the model grid points using statistical scores (threat score, equitable threat score, and bias score) for different threshold values based on rain gauge observations. The information obtained from these series of experiments should be useful for improvement of cumulus parameterization schemes intended for operational usage over the study region.