Data Assimilation of Doppler Weather Radar Data in the Predictions of Mesoscale events

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The Assimilation of GTS-AWS Data, Doppler Weather Radar (DWR) Data (radial winds and reflectivity) are useful for improvement of the numerical prediction of mesoscale weather events. Mesoscale convective systems (MCS) are responsible for majority of the squall events and related natural hazards that occur over Bangladesh and surrounding region in pre-monsoon season (March - May). In the present paper efforts were made to study two pre-monsoon hail events of 2013. DWR Data of Bangladesh Meteorological Department (BMD) are used to study the squall events through 3-dimensional variational (3DVAR) data assimilation technique within the Weather Research Forecasting (WRF) modeling system. Two sets of experiments (CTRL run and 3DVAR) on each case have been applied. Comparison between observed and simulated features of the squall events is made. The model results are also compared with Kalpana-1 satellite imageries, DWR Radar and TRMM products, BMD and India Meteorological Department (IMD) predicted results in order to evaluate the model performance. Some improvements in predictions have been noticed after Data Assimilation of DWR parametres.

Keywords: MCS, WRF Model, 3DVAR, DWR radial wind.