## Simulation of Tornadic and Hailstorm Events in Bangladesh

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Tornadic thunderstorms were reported in the southwestern parts (Jhenidah and adjoining area) of Bangladesh on 17 February 2010. Similarly, hailstorm were reported in the middle parts (Dhaka and adjoining area) of the country on 24 February 2010. The events are studied based on field survey, ground and Radar observations. DWR (Doppler Weather Radar) Kolkata recorded the 17 February event with hook shaped echoes as TVS (Tornado Vortex Signature). Large scale atmospheric conditions of the event (WRF model products and satellite pictures) showed that there was a confluence of airflow over the Bangladesh region resulting from the passage of a western disturbance and the presence of a low level anticyclonic circulation over the Bay of Bengal. The vertical extent of the 24 February2010 system was about 14 km, the RADAR reflectivity 60 dBz and the horizontal extent was 40 km as recorded by DWR Kolkata.

Advanced Research WRF (ARW) model, developed by the National Centre for Atmospheric Research (NCAR) of USA is utilized to simulate the events. National Centre for Environment Prediction (NCEP) FNL data is utilized as initial and lateral boundary conditions (LBCs) at six hourly intervals. The model has been run at 2 km horizontal resolution with 27 vertical levels. Among the typical characteristics of the storms, the CAPE, surface wind speed, flow patterns, rainfall, sea level pressure and vertical velocity are studied. It is revealed that WRF model is able to simulate some of the salient features of the systems with some temporal lagging and spatial shifting. The maximum wind speed simulated by the model is severely underestimated as compared to observation.

Keywords: Tornadic thunderstorms, TVS, CAPE.