

Understanding the Triggering of Nor'westers over West Bengal, India

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Every year during premonsoon season, the eastern parts of the Indian subcontinent experiences severe thunderstorms. These mesoscale convective storms are locally known as 'Kalbaishakhi' or 'nor'westers'. To forecast these organized storms with sufficient lead time it is important to know the convective initiation processes responsible for triggering these organized cloud formations. ARW-WRF model version 3.9.1.1 with a cloud resolving horizontal resolution of 1 km has been run using IITM GFS T1534 as initial condition to understand the trigger mechanism. One particular case of thunderstorm has been taken for this study that occurred on 24th February, 2019 over West Bengal, India and Bangladesh. It is observed that there is a distinctive difference between the microphysical processes over the region (Purulia [23° N, 86° E]) where the clouds started to organize with that of a region (Kolkata [22.5° N, 88° E]) where the storm moved after being fully developed. The thermodynamics and near surface dynamic processes over Purulia also show significant changes before and after the storm was triggered. Closely observing low level meteorological features of these regions can help us to identify the trigger mechanisms and will enable more accurate forecasts of thunderstorms.

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