



A step towards dynamic forecast and monitoring of severe storms and cloudbursts in Higher Himalayas

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Kumaon and Garhwal region of Central Himalayas have most challenging characteristics of mountain meteorology due to unique terrain features, vegetation, glaciers and complicated river systems. Some unique convective systems which cause cloudbursts and extreme rainfalls predominantly control the meteorology of this region. Though the exact mechanism of these convective systems is not yet perfectly understood, research bibliography suggests that they are manifestations of intense vortices on small scale. These vortices generate strong convective currents which lift the moisture laden air with sufficient rapidity to form cumulonimbus clouds which shed their water load with great strength and ferocity. Orographic configuration and glacial lakes of this region make the vertical lifting substantially complex for the formation and movement of cumulonimbus clouds. The complex vegetation and changing features of land surface are also contributing to the complexity to the convective systems. This paper aims at designing of a high resolution network of advanced hydro-meteorological instruments with overview of dynamic forecasting of complex convective systems over this region. Fine resolution dynamic Weather Research and Forecast Model (WRF) are being tested with different parameterization schemes to resolve the fine scale convective processes and their associated micro-physics.

Keywords: Severe storm, Mountain meteorology, Cloudburst, Extreme rainfall, Convective system, Dynamic modeling, Forecast system, Central Himalayas.