Simmulation of Extreme Weather Events over India by using High-resolution Non-Hydrostatic Model

P Samantray[(1,2)],K C Gouda[(1)]

(1) [1]CSIR Fourth Paradigm Institute Wind Tunnel Road, Bangalore, India-560037

(2) [2] Visvesvaraya Technological University, Belagavi, Karnataka,India-590018

The title refer to the idea of 'extreme events'; which interpreted not only the present context in a statistical sense, but also the spontaneous appearance and disappearance of local, sudden, intermittent events with large gradients in the atmosphere or the oceans. India being mainly an agricultural country, the economy and further its growth purely depends on the vagaries of the weather and in particular the extreme weather events. The socio- economic impacts of the extreme weather events such as floods, droughts, cyclones, hail storm, cloud burst,thunderstorm, heat waves have been increasing due to large growth of population and its migration towards urban areas which has led to greater vulnerability. Our study based on the assimilation of Non hydro-static model to analyze the extreme events and their impacts over Indian domain. The non-hydrostatic model is used to simulate the extreme weather event over Indian region In this area, convection plays an important role so different convective parameterization schemes (CPS) were analyzed. Model resolution is also analyzed in terms of quantitative precipitation forecasting. The development of non-hydrostatic atmospheric models, which retain the vertical acceleration term and thus capture strong vertical convection, has also been pursued over a period of more than decades. This improvement has facilitated a transition from highly developed hydro-static models towards non-hydrostatic models. Over the past decade, atmospheric research institutions have begun replacing their operational hydro-static models with non-hydrostatic versions. The model is designed for a broad range of spatial and temporal scales so that it can be applied for a variety of applications like weather forecasting and climate simulations on regional and global scales.

Such study will help to identify operative model deficiencies and point out specific needs for improvement in the predictive skill of the atmospheric model under different weather events.

Key words:'extreme events', 'non-hydrostatic model','convective parameterization schemes '