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Departmental Seminar

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Seminar Title : Disentangling the Contribution of Moisture Sources Supporting Tropical Cyclone Genesis over the Bay of Bengal Using a Lagrangian (FLEXPART) Model

Speaker : Prof. Naresh Krishna Vissa

Supervisor : 8125817908

Venue : ER-303 Class Room

Date and Time : 26 Sep 2024 (04:20PM)

Abstract : Undoubtedly the availability of water vapour, i.e., in terms of amount of moisture present in the atmosphere and especially at the mid-troposphere has a vital role in tropical cyclone genesis (TCG). Nevertheless, it remains unclear where this moisture is coming from a particular region (source) to support the TCG over the Bay of Bengal (BoB) region. Current study attempts to reveal various moisture sources and their contribution percentages promoting TCG activity over the BoB during different seasons (pre and post-monsoon), using a three-dimensional Lagrangian model running with NCEP-FNL data. Interestingly, the study identifies important moisture sources (local and remote) regions as well as moisture pathways through which moisture is transported towards the BoB-TCG region using k-means method. Where, Pre-monsoon (Mar-Apr-May) TCG activity is dominated by intense low-level westerly/southwesterly trajectories propagating across the North Indian Ocean covering the Somalia coast and the Arabian Sea. Meanwhile, during post-monsoon (Oct-Nov-Dec), north-easterly/easterly trajectories are more prevalent and bring moisture to the BoB TCG region from the South China Sea and North-West Pacific. Furthermore, the study demonstrates relevant mechanisms such as an evaporation process in association with a dynamic uplifting caused by an anomalous cyclonic circulation and horizontal advection, which responsible for the spatio-temporal variation in quantitative contributions of each source region.