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Registration Seminar

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Seminar Title	: Role of observational and backgrounds errors on assimilation of Oceansat-3 winds: Impact assessment on tropical vortices over the North Indian Ocean
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Venue	: ER-303, Dept of ER
Date and Time	: 16 May 2025 (4:45 PM)
Abstract	: Ocean surface winds (OSWs) are one of the vital meteorological components in understanding different oceanic dynamical processes and improving the initial conditions of numerical weather prediction (NWP) models. Satellite scatterometry has been a widely accepted technique for monitoring OSWs, as conventional observing systems over the oceans are sparse, localized, and difficult to maintain. This thesis uses the scatterometer winds from Oceansat-3 (O3SCAT), launched by the Indian Space Research Organization. The observation error covariance (OEC) matrix, by validating the O3SCAT winds, is prepared for their assimilation in the Weather Research and Forecasting (WRF) model. However, improper specification of the background error covariances (BECs) may lead to too large or too small analysis increments. The study aims to comprehensively examine the influence of incorporating different BECs estimated using various methods, such as the NMC method for CV5 and CV6 (wherein the humidity variable additionally has multivariate contributions in the balance relations), to enhance our understanding and predictive capabilities in capturing the dynamics of vortices over the North Indian Ocean (NIO). Single-observation tests will be performed over the NIO using the calculated domain-dependent BEC and the default BEC available within the WRF-3DVAR. It is done to examine how the influence of the available observation information spreads to other regions of the domain.

**Key words:** Ocean surface winds, Oceansat-3 scatterometer, assimilation, covariance, WRF model.