National Institute of Technology Rourkela

Progress Seminar

Seminar Title	: Assessment and understanding of the variability of hydrographic features in OMIP2 models in the Tropical Indian Ocean
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Venue	: ER 303
Date and Time	: 08 Jan 2025 (4:00 PM)
Abstract	: The present study aims to analyze the available Ocean Model Intercomparison Project Phase-2 (OMIP2) models from the Coupled Model Intercomparison Project Phase-6 (CMIP6) group in representing the seasonal mean variations of temperature and salinity. The skill of the models in representing seasonal mean biases of temperature and salinity is assessed with World Ocean Atlas and Argo observations over the Tropical Indian Ocean (TIO), Bay of Bengal (BoB), Arabian Sea (AS), and Southern Indian Ocean. It is identified that most of the individual models and multi-model mean of OMIP2 models exhibit a cold (surface) and warm (subsurface) temperature bias over the entire TIO. The salinity analysis reveals that most of the TIO (except the equatorial TIO) is dominated by saltier biases, especially predominant over the south AS and the western BoB. Vertical shear of horizontal currents (VSHC) and the Brunt-Väisälä frequency have been analyzed to understand the stability of the Ocean, suggesting that the VSHC contributes to the vertical mixing resulting in weak stratification, is mainly responsible for the persistence of surface cold and subsurface warm biases. In addition, Freshwater transport (FWT) was estimated at different straits, suggesting that FWT can modulate the salinity in the fresh region of TIO. In addition, the interannual temperature and salinity variability have been addressed using the same models for the dominant bias regions in the TIO. Then after, we will focus on the role of heat and salt transports from different straits and their influence on the TIO variability in OMIP2 models. Later, we will demonstrate the ocean circulation and water mass characteristics through heat budget analysis in the TIO in OMIP2 models. The overall study summarizes the improvement and necessity of ocean models for an accurate representation of vertical hydrodynamic conditions for skilful seasonal forecasts.