

Study of Large-Scale Atmospheric Convection over the Tropical Indian Ocean and Its Association with Oceanic Variables

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Abstract : In India, the summer monsoon rainfall occurs owing to large scale convection with reference to continental ITCZ. It was found that convection over tropical ocean increases with SST from 26 to 28 degree C, and when SST is above 29 degree C, it sharply decreases for warm pool areas of Indian and for monsoon areas of West Pacific Ocean. The reduction in convection can be influenced by large scale subsidence forced by nearby or remotely generated deep convection, thus it was observed that under the influence of strong large scale rising motion, convection does not decrease but increases monotonically with SST even if SST value is higher than 29.5 degree C. Since convection is related to SST gradient, that helps to generate low level moisture convergence and upward vertical motion in the atmosphere. Strong wind fields like cross equatorial low level jet stream on equator ward side of the warm pool are produced due to convection initiated by SST gradient. Areas having maximum SST have low SST gradient, and that result in feeble convection. Hence it is imperative to mention that the oceanic role (other than SST) could be prominent in influencing large Scale Atmospheric convection. Since warm oceanic surface somewhere or the other contributes to penetrate the heat radiation to the subsurface of the ocean, and as there is no studies seen related to oceanic subsurface role in large Scale Atmospheric convection, in the present study, we are concentrating on the oceanic subsurface contribution in large Scale Atmospheric convection by considering the SST gradient, mixed layer depth (MLD), thermocline, barrier layer. The present study examines the probable role of subsurface ocean parameters in influencing convection.

Keywords : sst, d20, olr, wind

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