

High frequency intra-seasonal variability in the eastern equatorial Indian Ocean

P.M.Muraleedharan, S. Prasannakumar, *K.Mohankumar, K.U.Sivakumar
National Institute of Oceanography, Goa, India

*Dept. of Atmospheric Science, Cochin University of Science & Technology, Kochi, India

Abstract:

Six hourly time series upper air observations were carried out at the eastern equatorial Indian Ocean in and around 80 E during September-October 2011 to study the intra-seasonal variability leading to the understanding of MJO convection as a part of the international CINDY2011 mission. Water column measurements were also carried out every three hourly to investigate the process of ocean atmosphere coupling in the intra-seasonal scale. Surface meteorological observations were collected using dedicated surface met kit supplied by IMD.

The seventeen days 6 hourly time series ascends and the 1 degree ascends along the meridional section at 83 E have given interesting information of high frequency intra-seasonal variability at the eastern equatorial Indian Ocean. Very strong signals of 4-5 days periodicity is noticed in all the geophysical time series ascends collected at 80-83 E. The resurfacing of LaNina after July 2011 reestablished the India-Pacific walker cell from western Pacific to the central Indian Ocean and its indication is unambiguously displayed in the zonal wind component (Fig.1). Both limbs of the walker cells exhibited the well defined high frequency periodicity. Interestingly both relative humidity (RH) and meridional wind component displays downward propagation of air mass in bands of high and low RH associated with northerly and southerly winds respectively (Fig.1). This can be attributed to the subsidence in the vicinity of converging walker cells west of 80 E. The wind vector maps indicate the zones of divergence and convergence in the 100 hPa level in the western Pacific and in the central Indian Ocean respectively during late September. We have also indications that this high frequency variability propagates down right up to the surface to interfere with the boundary layer processes. A clear 4-5 days periodicity is found in the latent heat flux throughout the period of observation and to a lesser extend in the sensible Heatflux. Whether this variability penetrates to the water column is yet to be investigated. The characteristics of the propagation resembles that of the mixed rosbby gravity wave that normally asymmetric to the equator

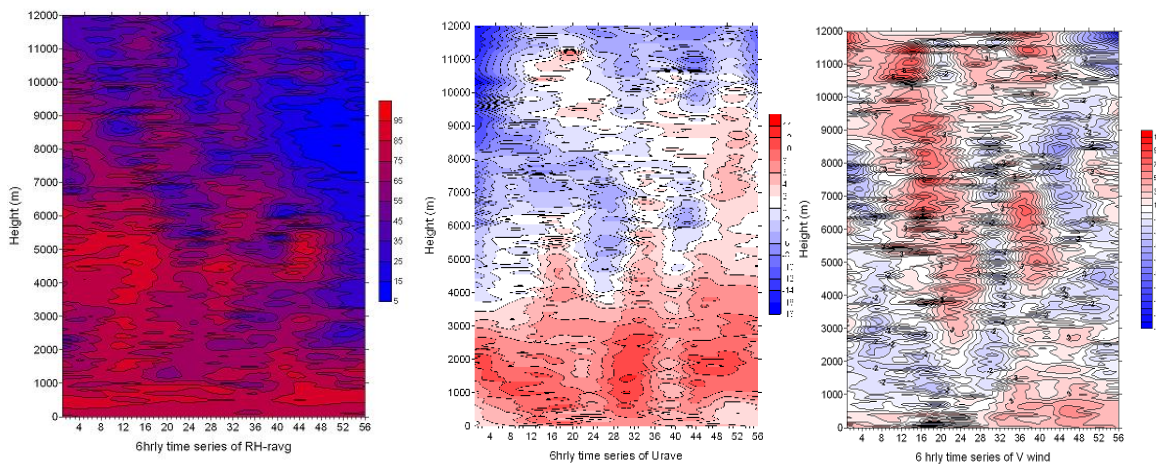


Fig. 1. 6 hrly time series profile of relative humidity (left), u-wind (middle) and v-wind (right)