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Ocean response to CINDY/DYNAMO MJOs in air-sea coupled COAMPS

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The most striking direct response to the westerly zonal wind stress associated with the onset of the MJO is a rapidly accelerating Yoshida jet in the ocean mixed layer with equatorial zonal currents exceeding 1 m/s. It is superimposed on the seasonal Wyrtki Jet that has a subsurface local maximum between 50m and 150m. Sea surface elevation response shows westward propagating Rossby waves symmetric around the equator. Prior to the onset of the MJO events, net surface heat flux is above 100 W/m^2 over large areas in the western Indian Ocean and along the equatorial region. Daily averaged SSTs are above 29^{o}C east of 60^{o}N. During the active MJO phase, heat flux into the ocean is negative due to reduced downward solar radiation and wind-induced evaporation, rapidly cooling the upper ocean, deeping the mixed layer and strongly dampening the diurnal SST amplitude.

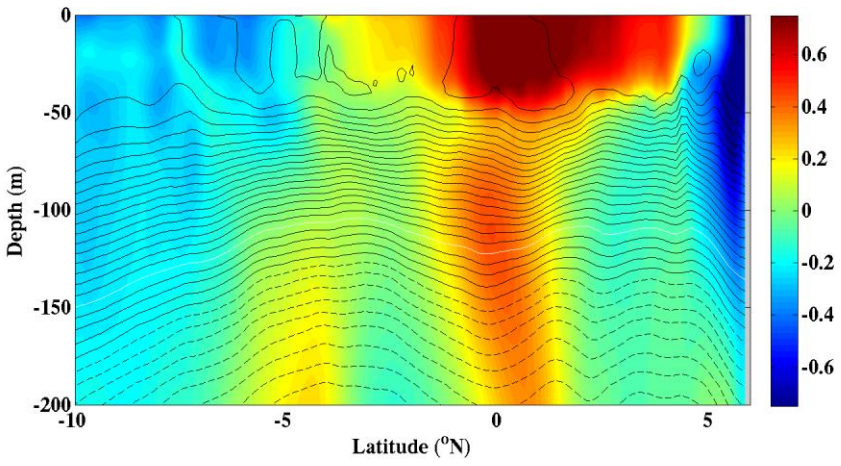

Fig. Cross section at 80.5^{o}E of daily averaged zonal velocity component (color) on Nov 25, 2011 and temperature (contours: dashed less that 17.5^{o}C; full above 18^{o}C; white 20^{o}C).