Impact of Atmospheric Madden-Julian Oscillations on the Zonal Currents in the Eastern Equatorial Indian Ocean during 2004-09

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Analysis of up-looking Acoustic Doppler Current Profilers (ADCPs) data collected collected during 2004-09 through an array of moorings at 77°E, 83°E and 93°E along the Equator in the eastern Equatorial Indian Ocean (EIO) is presented. The time series of zonal currents are band-pass filtered with 30-60 day period to examine the intraseasonal variability associated with the Madden-Julian Oscillations (MJO). The 30-60 day band-passed filtered zonal currents indicated intraseasonal variability impacted by the atmospheric Madden Julian Oscillation (MJO) events. The anomalies of surface zonal winds and Outgoing Longwave Radiation (OLR) also showed clearer signals of MJO during this observational period – showing the active and suppressive phases of precipitation associated with the MJO. The zonal currents during the active phase of MJO are strongly eastward at 77E in the Central basin and westward in the eastern basin (93E) of EIO. The amplitude of zonal currents at 30-60 day period is as large as 20 cm/s and exhibited interannual variability. During the period of observations, the EEIO experienced negative / negative Indian Ocean Zonal Mode (IODZM) events. The Outgoing Longwave Radiation and surface zonal winds during the period of observations reveal eastward propagation of MJO events. The 30-60 day band pass filtered zonal currents showed variability corresponding to the surface winds and convection centers associated with the MJOs. Over the spatial coverage of observations (77E to 93E) the zonal currents showed the pattern consistent with the propagation of active phase of MJO and suppressive phase of MJO. These interesting results will be discussed.