Variability of Observed Temperature and Currents in the Eastern Equatorial Indian Ocean during 2004-09

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We present the analysis of the Acoustic Doppler Current Profiler (ADCP) measured currents at 77E, 83E and 93E locations from the Eastern Equatorial Indian Ocean for the period 2004-09. Also, we include the analysis of Recording Current Meters (RCMs) measured temperature and currents data from deeper depths (>500 m). The observational period covers several positive/ negative Indian Ocean Zonal Mode (IODZM) events. The observed currents exhibited strong anomalous variability in the upper layer as well as at deeper depths. During 2004-06, the zonal current structures at 77E, 83E and 93E reveal longer persistence of Equatorial Jets (EJ) at 77E and 83E, and shorter bands of EJ at 93E. At 77E, persistence of eastward flowing Fall Jet in the 75 -150 m layer from October 2006 to May 2007 and Monsoon season Equatorial Undercurrent (EUC) in the 200-350 m layer during mid-June to mid-August 2007 and spring season EUC in the 100-150 m layer during February – April 2008. A 9-10 month period westward flow is evident in 150-200 m layer during October 2006 – May 2008. Similar 9-10 month period westward flow is also present at 83E in the 250 – 400 m layer with a peak in August 2008 and the next strong peak in May 2009. During June 2008 – October 2009, at 83E location, zonal currents reveal eastward flow from June to mid-August, 2008 with a strong (60 cm/s) flow by mid-July 2008, and opposing westward flows at deeper depths. By September-October, 2008, the currents at 128 m reversed towards west and strengthened further in November-December, 2008. From January-mid-May, 2009, the zonal currents at 128 m showed strong eastward current in April, 2009. The flow became westward (50 cm/s) from mid-June to mid-July and changed to weaker eastward (30 cm/s) flow in August-October, 2009. The pattern of variation of zonal currents during February-October, 2009 is very interesting with considerable variability from 128 m to 480 m. Further at 500 m and 1000 m depth, the westward flows at 83E location are associated with warm temperature anomaly and eastward flows are associated with cold temperature anomaly during 2008-2009. These interesting results will be discussed.