Intraseasonal Mixed Layer Temperature and Salinity Variation in the Eastern Equatorial Indian Ocean

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Atmospheric forcing from Madden-Julian Oscillation (MJO) produces sea surface temperature (SST) variation on intraseasonal timescales in the tropical Indian Ocean. In this study, we investigate the ocean mixed layer temperature variation in the eastern Indian Ocean to clarify the processes that produced the intraseasonal SST variation. We used mooring buoy data from the Research Moored Array for African-Asian-Australian Monsoon Analysis and Prediction (RAMA) in the Indian Ocean, particularly on an eastern site at 1.5S, 90E. We focused on intraseasonal SST cooling events as an indicator of the intraseasonal variation. The buoy observation captured 14 MJO events in the Indian Ocean from November to May during 2002-2007. In general, the events accompany by large-scale SST decreases in the central and eastern Indian Ocean with the onset of atmospheric convection and westerly winds. Mixed layer temperature balance analysis demonstrated that the intraseasonal SST variation was mainly produced by surface heat fluxes, in which suppressed shortwave radiation and enhanced latent heat loss had major roles. Horizontal heat advection also acted to cool mixed layer temperature during the period, though the contribution was less than one third of the net surface heat flux. Deepening of mixed layer and low salinity signal were also observed during the events. Possible impacts of the ocean variability on the mixed layer heat content are discussed.

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