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Abrupt termination of Indian Ocean dipole events in response to intraseasonal disturbances in a coupled general circulation model

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We have investigated the role of atmospheric intraseasonal disturbances on termination of the Indian Ocean Dipole (IOD) using multiple datasets and a coupled general circulation model. We observed significant 30-60 day (20-50 day) atmospheric disturbances associated with equatorial westerly zonal winds prior to termination of all pure IOD events in data (in CGCM model results). The westerlies excite anomalous downwelling Kelvin waves that terminate the basin-wide coupled processes by warming the eastern Indian Ocean. The 1982 and 1997 IOD events coincide with the strongest El Niño events; during those years the intraseasonal disturbances are weak in real world. Heat budget analysis of model results confirm that deepening of thermocline in response to intraseasonal disturbances was primary reason for termination of IOD events.

Keywords: Indian Ocean Dipole, El Nino Southern Oscillation (ENSO), Madden-Jullian oscillations.