Regression Analyses of Mounier's Quasi Bi-Weekly Zonal Dipole Mode

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Abstract

Mounier, et al (2008) use EOF analysis to uncover and describe a quasi-stationary dipole of precipitation between the West African Monsoon system and the West Atlantic/Caribbean Sea. This mode, termed the Quasi Biweekly Zonal Dipole mode, operates on timescales of roughly 13 days. The stationary nature of this dipole is focused upon in their work, while the role of Kelvin waves in the mode are considered secondary. In this work, the role of Kelvin waves in the dipole mode are considered. Regression analyses are performed with time lags to observe how the dipole evolves with time. Kelvin waves are observed to dominate the timing and the phase of the dipole mode. The second EOF pattern is also examined with lagged regressions; a weak relationship is found between it and the first EOF pattern. EKE filtered for African Easterly Wave propagation are included in these regressions to see if the mechanisms behind the QBZD have an effect on the strength of these waves. A case study from the AMMA-EOP is also briefly considered.