



Ocean-atmosphere interaction key aspect of the Madden-Julian Oscillation

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The Madden-Julian Oscillation dominates intra-seasonal climate variability in the Tropics, plays an important role in the El Niño Southern Oscillation, and influences weather around the world. Despite its importance, uncertainties exist in the mechanism for the MJO and it is poorly simulated and predicted by models. Although ocean-atmosphere interaction is believed important to the MJO, no consensus exists. Here we show using an AGCM coupled to a one-column ocean model that ocean-atmosphere interaction is indeed central to the dynamics of MJO, playing an important role in its strength, frequency, zonal wave number and eastward propagation speed. Comparison among observations and models with different degrees of ocean-atmosphere interaction indicate that resolving temperature variations of only the upper few meters of the ocean is essential to accurately simulate the eastward movement of the MJO over Indo-Pacific warm pool.