

Large-scale convectively coupled tropical transients

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Large-scale tropical transients, such as convectively coupled equatorial waves and the Madden-Julian Oscillations (MJO), are intriguing examples of the interaction between large-scale circulation and moist convection. We first consider the coupling between moist convection and large-scale waves (2-dimensional gravity waves first and then equatorial waves) in the absence of feedbacks from surface fluxes, radiation, or horizontal moisture advection. This coupling gives rise to large-scale waves that are (modified) gravity waves in nature. We then explore the characteristics of moisture modes, the instability and propagation of which are dictated by the column moist static energy budget, in highly simplified contexts, and discuss the implications to the MJO.