



Eastward-moving Equatorial Modons: Missing Chain Link in the Dynamics of the Tropical Atmosphere?

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We report a discovery of steady long-living slowly eastward-moving large-scale coherent twin cyclones, the equatorial modons, in the shallow water model in the equatorial beta-plane, the archetype model of the dynamics of the tropical atmosphere. We start by constructing analytical asymptotic solution in the non-divergent velocity approximation for tropical motions, and then show by simulations with a high-resolution numerical scheme that such configurations evolve into steady dipolar solutions of the full model. The modons persist in the presence of moist convection, being accompanied and enhanced by specific patterns of water-vapor condensation, and can provide a new insight into dynamical nature of the Madden-Julian oscillation.