Geophysical Research Abstracts
Vol. 16, EGU2014-7715, 2014
EGU General Assembly 2014

Shallow to deep convection transitions in Madden-Julian Oscillation and the role of detrain moisture from ITCZ

Samson Hagos

Pacific Northwest National Laboratory, P.o.Box 999, MSIN K9-24, Richland Washington, United States (samson.hagos@pnnl.gov)

One of the unsolved mysteries of the Madden-Julian Oscillation (MJO) is the large-scale evolution from shallow to deep convection during its initiation over the Indian Ocean. While the ubiquitous shallow as well as congestus clouds gradually moisten the lower troposphere, the relatively rapid transition to deep convection suggests some other more effective mechanism of moistening the mid-troposphere might be in play. Using cloud system resolving model simulations and observations during the 2011 AMIE/DYNAMO field campaign over the Indian Ocean, we show that moisture from falling, evaporating snow and ice particles of previous deep convection can provide this moistening. Successions of advective mid-tropospheric moistening and transitions to deep convection link shallow to deep convection transitions in MJO to the Inter-tropical Convergence Zone.