

Thermodynamical Processes Associated with the Life-cycle of the Monsoon Intraseasonal Variability in CFES Integrations

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The equatorially trapped convective anomalies associated with the Madden-Julian oscillation (MJO) interacts with the mean monsoon during boreal summer resulting in north-northward migration of convective anomalies over the northern Indian Ocean and tropical west Pacific. First, in climate models, the necessary and sufficient conditions required for realistic simulation of monsoon intraseasonal variability will be summarized. Second, moisture and moist static energy budget diagnostics are applied to free runs of two versions of Coupled model For Earth Simulator (CFES) -difference between the two runs being changes made to cumulus convective schemes, particularly the vertical structure of entrainment. Third, budget diagnostics are applied to an AMIP-type simulation performed with the Atmospheric model For Earth Simulator (AFES). In the model simulations, the leading thermodynamical processes responsible for the monsoon variability will be discussed. Finally, results from CFES and AFES runs will be compared to understand (if any) the role of air-sea interaction in monsoon intraseasonal variability characteristics.

Keywords: Monsoon Intraseasonal variability, CFES simulations, Entrainment