Geophysical Research Abstracts
Vol. 20, EGU2018-14425, 2018
EGU General Assembly 2018

408 Intraseasonal Variability in a Cloud-Permitting Equatorial Aqua-Planet Model

Marat Khairoutdinov

Stony Brook University, School of Marine and Atmospheric Sciences, Stony Brook, United States (marat.khairoutdinov@stonybrook.edu)

A spectrum of disturbances have been simulated using a cloud-permitting model in idealized framework of equatorial near-global aqua-planet with uniform and constant sea-surface temperature (SST). Despite the uniform SST, easterlies develop in the tropics with westerlies at higher latitudes. A prominent feature of the study is the development of a strong MJO-like mode with Gill-like pattern of outgoing longwave radiation and winds. In an experiment in which the surface enthalpy fluxes are zonally homogenized, the MJO-mode still develops owing to the radiation feedback, but does not propagate. Zonal homogenization of the radiative heating does not eliminate zonal wavenumber #1 mode, but makes it move faster resembling the Kelvin-wave mode. Zonal homogenization of wind-speed in the surface flux formulation, that is eliminating WISHE, prevents MJO from developing and destroys active MJO. Zonal homogenization of surface-to-air enthalpy difference in surface flux formulation, that is increasing the role of WISHE, produces even stronger propagating wavenumber 1 modes. The physics of higher frequency equatorially trapped modes, such as Kelvin and mixed Rossby-gravity waves, produced in these simulations, will be also discussed.