

MJO in a Cloud-Permitting Near-Global Equatorial Aqua-Planet Model

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The System for Atmospheric modeling (SAM) has been run at a horizontal grid spacing of 4 km and 20 km on an equatorial aqua planet with actual equatorial circumference, extending from 46° S to 46° N latitude with a fixed, uniform sea surface temperature (SST) with perpetual equinox solar radiation. The simulations have been run for as long as one year. Despite the uniform SST, a whole range of equatorially trapped disturbances, such as Kelvin waves and a strong Madden-Julian Oscillation (MJO) have developed. Homogenizing the surface fluxes, does not prevent the formation of zonal number one mode, but completely arrests its eastward propagation. In this and in other respects, the mode behaves like self-aggregation on a sphere. The results of other mechanism denial experiments, such as homogenization of radiation and eliminating WISHE, will also be discussed.

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