MMM SEMINAR SERIES

Effects of organized mesoscale convection on the MJO and precipitation in E3SMv1 and CESM2

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Mesoscale organization of convection is typically not represented in global circulation models, and hence its influence on the global circulation is not accounted for. The heating component of a parameterization that represents the dynamical and physical effects of circulations associated with organized convection, referred to as the multiscale coherent structure parameterization (MCSP), is implemented in the Energy Exascale Earth System Model version 1 (E3SMv1) and the Community Earth System Model version 2 (CESM2). Numerical simulations are conducted to assess its impact on the simulated climate. Besides E3SMv1 simulations, we performed high-resolution (2 km) simulations using the Weather Research and Forecasting (WRF) Model to determine the temperature tendencies induced by mesoscale convective systems embedded in deep convection. We tuned the free parameters of the MCSP based on the WRF simulations. MCSP heating enhances Kevin wave spectra in E3SMv1, improves the representation of the Madden-Julian Oscillation, and reduces precipitation biases over the tropical Pacific. The momentum transport associated with organized mesoscale convection is also implemented and its impact on the simulated climate will be presented.

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For Zoom information, please contact
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Seminar will also be live webcast
https://operations.ucar.edu/live-mmm