



Sensitivity of the tropical atmosphere to the high-frequency variability associated with convection.

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In a non-linear system, fast, small-scale variability can often play a role in determining the system's slow, large-scale behavior and mean state. A consequence of this is that the behavior of the atmosphere at scales resolved by GCMs may be sensitive to variability at poorly resolved scales, where parameterized sub-grid processes such as deep moist convection dominate. The nature of this sensitivity can be explored by using stochastic parameterizations to enhance and control the variability of the convection scheme in a model. To investigate the interaction of convective variability with the larger-scale atmospheric physics, some simple stochastic parameterization schemes from the literature are implemented in an Ensemble Single-Column Model simulation of the atmosphere over the Tropical West Pacific Warm Pool. The ensemble's variability and mean state are found to be sensitive to the nature of the convective variability, and mechanisms for this sensitivity are explored.