Analysis of Typhoon Tropical Cyclogenesis in an Atmospheric General Circulation Model

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Low-resolution atmospheric General Circulation models (AGCMs) are able to produce tropical cyclones with the same qualitative features as observed ones, however the model tropical cyclones have a much larger horizontal extent and are much weaker than observed tropical cyclones. The spatial and temporal distribution of the model tropical cyclones are similar to the observed ones in most regions, which lead to efforts of using the model tropical cyclones to produce seasonal forecasts of tropical cyclone frequency. The understanding of the process of model tropical cyclogenesis is important in order to gain confidence in the model predictability and possibly correct model biases.

Here ``tropical cyclogenesis" in a low-resolution Atmospheric General Circulation model is studied, focusing on the Western North Pacific region during the June-October typhoon season. Time-dependent composites of the cyclones are formed and analyzed, with a focus on the temporal evolution of quantities averaged in space around the storms center. The local minimum in many variables' time series suggests the presence of an initial disturbance that is suddenly enhanced, becoming a model tropical cyclone, as has been noted in observations.