6.3 Impact of the cumulus scheme on model initialization of convective storms.

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Convection-permitting forecasts are typically initialized with coarse-resolution analyses generated using a model component with parameterized convection. Parameterized convection models are known to have issues with accurately predicting the timing and intensity of the diurnal precipitation cycle. Recently, Bechtold et al. (2014) introduced a CAPE closure and demonstrated its ability to improve the timing of the diurnal cycle by accounting for boundary-layer forcing. This approach is available in WRF-ARW since V3.8.1, known as the "New Tiedtke" scheme. Using WRF-DART, we first examine the differences in the systematic model biases between two model systems, which are identical except for their convection scheme. One uses the previous Tiedtke scheme, and the other uses the "New Tiedtke" scheme with the improved representation of the diurnal precipitation cycle. We then test the sensitivity of initializing a convection-permitting model with the control (using the previous Tiedtke scheme) and the improved (using the "New Tiedtke" scheme) coarse-scale analyses. Results will be shown for a retrospective forecast period during spring 2017 over the central United States.