P46 WRF simulations of a long-lived MCS: Model sensitivity.

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WRF-ARW was utilized to simulate a long-lived mesoscale convective system (MCS) on 06 October 2014 that persisted through much of the diurnal cycle and was poorly forecast operationally. The MCS initiated at 02 UTC in a region of little convective available potential energy (CAPE) ahead of a midlevel short wave trough as it approached a stationary front draped across Oklahoma. This system later went on to produce numerous severe reports and a nocturnal tornado before moving off the Gulf coast. RAP initial conditions were utilized with 3-km and 1-km nested grids. Several physics schemes were used to obtain a realistic simulation long-lived MCS. When the domains were expanded laterally, it was discovered that the simulation was highly sensitive to both the lateral and boundary conditions, with varying grid configurations resulting in completely different storm evolutions despite using the same physics schemes. Additionally, significant differences were found when running the simulation with one-way and two-way nesting, implying that feedback from the 1-km grid is crucial for the longevity of the MCS in the simulations.