

## ***Interactive comment on “Sensitivity of the Community Multiscale Air Quality (CMAQ) Model v4.7 results for the eastern United States to MM5 and WRF meteorological drivers” by K. W. Appel et al.***

### **Anonymous Referee #3**

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As stated at the end of the introduction, ‘This study examines the operational performance of two sets of January and August 2006 CMAQ simulations, with one set using meteorological data provided by MM5 (MM5-CMAQ) and the other using data provided by the WRF model (WRF-CMAQ). The performance results for each simulation are presented and reasons for large differences in performance are discussed.’ While the performance results for each simulation are presented neatly, reasons for large differences in performance are not discussed thoroughly. In that sense, the objectives of the work are not fully achieved in this manuscript. This work points out that air qual-

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ity model predictions are sensitive to meteorological variables. This finding is not a surprise. The way the manuscript is written is a bit too descriptive and leaves more questions than answers. The authors may want to clarify or possibly redefine the objectives of the work. The methodology that is used to address the objectives is not detailed enough and some of the interpretations of the results in terms of dynamical processes are not well supported. Both MM5 and WRF were constrained using an objective nudging technique. The authors found the results to be dependent on vegetation fraction, friction velocity, and cloud fraction. What is driving the variability of these variables? These variables are related to dynamical processes, which are parameterised in those models. For instance, how is the friction velocity calculated? I would think that the objective nudging technique that has been used to constrain both models does constrain the variability of these variables. Hence, it might be difficult to identify clearly reasons for large differences in performance of the CMAQ simulations. This point needs to be discussed in the manuscript.

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