

## ***Interactive comment on “Application of WRF/Chem version 3.4.1 over North America under the AQMEII Phase 2: evaluation of 2010 application and responses of air quality and meteorology–chemistry interactions to changes in emissions and meteorology from 2006 to 2010” by K. Yahya et al.***

**Anonymous Referee #3**

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This paper evaluates the WRF/Chem model performance on reproducing the air quality and meteorology-chemical interactions in years 2006 and 2010 by comparing the model predictions of WRF/Chem and WRF, model results with each other and with observations. A series of sensitivity simulations have been conducted to evaluate the model response to changes in emission, meteorology and chemical BC/IC. The au-

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thors put a lot of effort to evaluate the model performance for various variables. The manuscript is well written and very informative in terms of statistical evaluation of the model against observations. However i have a number of major comments : 1) I would expect a lot more information on the model development part considering the journal it is submitted to. However, there are just references to other papers regarding the developments. The study as is is more than the application of the model version developed in previous studies by these authors. 2) i find it difficult draw robust conclusions on feedback mechanisms using two different years with different emissions and meteorology. This is particularly challenging over temporally and regionally averaged variables. Regarding the feedbacks, i would expect to see some episodic evaluations where these feedbacks really make a difference and see if the model is capable of simulating these effects. 3) I would expect more in depth discussion on the sensitivity section rather than just showing increase or decrease in the species.

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