Geoscientific
Model Development
Discussions

Interactive comment on "MM5 v3.6.1 and WRF v3.2.1 model comparison of standard and surface energy variables in the development of the planetary boundary layer" *by* C.-S. M. Wilmot et al.

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Reply to Referee #1

We appreciate the important comments made by the reviewer and we hope that our manuscript has improved.

The authors compare surface fluxes and PBL heights from one MM5 simulation and one WRF Version 3.2.1 simulation with observations. Although nicely presented, the paper needs definitely major revisions (including additional simulations) before is can be published in GMD. The authors use for their comparison a version of WRF that is almost four years old - they could have used at least version 3.5. They also test only

one PBL scheme for their inter-comparison and draw quite general conclusions from this single simulation for a very short episode. Besides of this, the used PBL scheme is considered as obsolete in WRF and labeled as 'to be removed in the future'. Therefore, I think it is absolutely necessary to redo the study with a more recent version of WRF and also test more PBL schemes in order to be of more general interest and thus justify publication in GMD. Due the very short episode that is studied, this should be easily possible.

Answer: In the revised version we performed new simulations with WRF version 3.5.1. We now used YSU as the PBL scheme in WRF and added the following sentence in Chapter 2.3 "WRF model": "In past air quality studies in Houston we used YSU and found promising results (Czader et al., 2013), and recent intercomparisons with other PBL schemes for the same area showed that YSU simulates vertical meteorological profiles as satisfactorily as the Asymmetric Convective Model version 2 (ACM2); the Mellor–Yamada–Janjic (MYJ) and Quasi-Normal Scale Elimination (QNSE), but may be the best to replicate vertical mixing of ozone precurors (Cuchiara et al., 2014)."

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