Geoscientific
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Interactive
Comment

Interactive comment on "Impacts of air–sea interactions on regional air quality predictions using WRF/Chem v3.6.1 coupled with ROMS v3.7: southeastern US example" *by* J. He et al.

Anonymous Referee #3

Received and published: 27 January 2016

The subject is appropriate to GMD. The authors provide insights about effects of two cumulus parameterizations and atmosphere–ocean coupling in WRF/Chem v3.6.1 on model meteorological, cloud/radiative, chemical predictions. The results show that different cumulus parameterization schemes can result in an 85m difference in the domain averaged PBLH, and 4.8 mm difference in the domain averaged daily precipitation. They also find that comparing to WRF/Chem without air–sea interactions, WRF/Chem with a 1-D ocean mixed layer model and WRF/Chem coupled with a 3-D Regional Ocean Modeling System predict the domain averaged changes in the sea surface temperature of 0.1 and 1.0 0C, respectively. The results confirm the benefits and needs of using coupled atmospheric–ocean model with advanced model representations of

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air–sea interactions for regional air quality modeling. Therefore I recommend clearly the acceptance for publication of this manuscript after minor revisions. Several editorial comments for improving the information content and presentation of the paper are listed as follows:

(1) P9966, Line 20: "Extensive validations against observations, show that. . .." Should be "Extensive validations against observations show that. . ."

(2) P9977, Lines 8-19: It will be better if you can compare your results to the performance of other models such as WRF-CMAQ under the general conditions to see if your new model has better performance for each species.

(3) P9984, Line 9: ". . ..study the sensitivity of cumulus schemes on model predictions" should be ". . ...study the effects of cumulus schemes on model predictions".

(4) P10002, Figure 4: I don't think that you need Figure 4 because all these results are already summarized in the related tables. Please delete it to reduce length.

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