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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Online coupled meteorology and chemistry models: history, current status, and outlook" *by* Y. Zhang

Y. Zhang

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Reply to Comments by Alexander Baklanov

Interactive comment on “Online coupled meteorology and chemistry models: history, current status, and outlook” by Y. Zhang A. Baklanov (Referee) alb@dmi.dk Received and published: 2 April 2008

The paper gives a really unique review of the history and current status of development and application of online coupled meteorology and chemistry models. After the mentioned COST overview of the European online coupled meteorology and chemistry models this is the first analysis of the online coupled models developed in USA. Of course many modern European online coupled models are not considered in this paper, however, I suppose, ir should be done as a separate paper (e.g. as a result of

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the COST Action 728). The needs of such an overview publication are very strong, because the online integration of meteorology and chemistry models with consideration of the climate-chemistry-aerosol-cloud-radiation feedbacks becomes the promissing way for future atmospheric simulation systems. It would lead to a new generation of models for improved climate, meteorology, environment systems studies and chemical weather forecasting. From scientific point of view the paper is interesting and will be very useful for modelers in meteorology, climate and environment. Proceeding from that I strongly recommend to publish the paper.

Reply:

The author fully agrees with the reviewer that a comprehensive review of European online coupled models should be a separate paper. The working group #2 on Integrated systems of MetM and CTM: strategy, interfaces and module unification under the COST action 728 (http://www.cost728.org) has done a great job in identifying a need for such online model development for accurate simulations of the climate-chemistry-aerosol-cloud-radiation feedbacks, summarizing model development and application activities for existing online coupled models in Europe and beyond, and providing recommendations for future online model development. It is therefore logical for COST action 728 to take a leadership to develop a comprehensive review of European online coupled models based on the COST’s reports in the near future.

To address comments from a few European colleagues, a few European models (in particular, those were not developed as part of COST action) will be briefly mentioned in the revised model. The U.S. models will remain the focus of the revised paper.

The paper is relatively long (however such a review should be long) and the final part with the case studies with the USA models GATOR-GCMOM, WRF/Chem, CAM3, MIRAGE and Caltech could be considered as a separate paper. However, it is a good complementary to the main review part.

Reply:

ACPD

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To make the case studies with the USA models such as GATOR-GCMOM, WRF/Chem, CAM3, and MIRAGE a separate stand-alone paper will require very significant efforts. A paper focusing on model intercomparison of these models will not be very meaningful if they were not set up with the same episode and differences in simulated feedbacks were not linked to the differences in model treatments. Such an intercomparison is, however, not feasible at present as they are very different models with very different model treatments and scales. The author would expect that a number of papers will be published for each of the individual models (including models reviewed or not reviewed in this paper) in the near future to illustrate the current model capabilities in simulating feedbacks, which will be a more realistic way at present.

On the other hand, as also indicated by the reviewer, the case studies presented in this paper logically supplement the detailed description in previous sections, they help illustrate some of the feedbacks discussed previously using a few examples with quantitative estimates on the magnitudes of some of such feedbacks, and also provide the current status of model capability in simulating such feedbacks with the state-of-the sciences treatments. So, the case studies presented in the paper sufficiently serve for such purposes.

To address the reviewer’s comment, the rationale for inclusion of case studies has been added in the revised version.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 1833, 2008.