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Interactive comment on “Projected effect of 2000–2050 changes in climate and emissions on aerosol levels in China and associated transboundary transport” by H. Jiang et al.

Anonymous Referee #1

Received and published: 3 May 2013

This paper discusses the results of simulations for 2000 and 2050, with a focus on China and transboundary transport. It thoroughly discussed the characteristics of the simulated changes between 2000 and 2050, differentiating between emissions and climate impacts.

Major comments:

This is a very complete analysis but the reader is little information on how could relate to other models and/or other scenarios. There are no discussions on how the present simulations compare to other simulations; it is clear that specific analyses are made here, but it would still be valuable to put the results of the present study into a bigger

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context.

My other comment relates to the use of 3 years and no assessment of statistical significance. For many studies in which climate and chemistry are coupled, a simulation length 3 years is not to ascertain that the shown differences are not simply a reflection of noise. While it is clear that changes in emissions are large, it is still unclear how that translates into changes in concentrations downwind and aloft. I would strongly urge the authors to extend the length of the simulations if at all possible as it strongly undermines the significance of the presented results.

Minor comments:

Page 6509, line 5: could you be more specific than “fairly well”? A presentation of the actual results would be useful.

Page 6510, line 8-9: why is the PBL depth predicted to decrease. This seems counter-intuitive to a warming world.

Page 6510, line 15: this seems to contradict the above statement on decreasing PBL height. Explain or rephrase.

Page 611, line 5: it would be nice to show those results, since it is likely that the model setup is not exactly the same as in the listed publications.

Page 6512, line 8: how is the meteorology for the nested domain generated from the climate simulations.

Page 6513, line 14: this is clearly a place where the analysis could be place in the context of other climate simulations (as in CMIP3 for example).

Page 6514, line 6-7: show comparison of precipitation with observations or at least reanalysis

Page 6514: Figures 7 and 8 should be on the same scale to ensure comparability

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Page 6518: from this section it would be interesting to discuss the potential rates of nonlinearities between the separate and combined impacts of emissions and climate changes.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 6501, 2013.

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