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Comment

## ***Interactive comment on “The relative importance of impacts from climate change vs. emissions change on air pollution levels in the 21st century” by G. B. Hedegaard et al.***

**Anonymous Referee #1**

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This paper presents a very interesting study on the relative impacts of climate changes to the projected emission changes. The investigation was well organized and the results are clearly presented. The dominant forces for the changes in ozone and particulate matter (PM) in the future are identified through the modeling study, which sheds some lights on the future air quality control strategies. I have no objection to the publication of this paper and have following points for the authors to consider before the publication:

(1) The impacts of climate and emissions on the changes in ozone and PM are described in the paper. As we know very clear that the climate change and emission sce-

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narios have many assumptions built in, it is suggested that the authors add a section on the uncertainties of the climate projections and emissions scenarios and hence the uncertainties of impacts predicted by the model. (2) The annual mean precipitation frequency in Figure 1 seems to have sharp meridional gradients at some latitudes, which is also quite systematic in the zonal directions. This could result in the same patterns of BC changes in Figures 4 and 5. Is this real? Need some explanations. (3) Most of the results are shown in the coloured figures with explanations in the manuscript. It would be more clear if a table is used to summarize these changes with numbers and statistics. (4) PM2.5 is exclusively mentioned in the paper. How it was simulated? Would the changes in precipitation have any impacts on the removal of PM as whole? I would like to see more on the mechanisms of the impacts of climate changes on PM and PM2.5. (5) The Summary and conclusions section is too long and duplicates quite a lot of the main sections. It is suggested to concise it. (6) Reading through the manuscript, there are a number of places that need polishing on the English usage. For example, in the abstract, it said “...(DEHM) driven on..” while it may better be “...(DEHM) driven by..”.

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 24501, 2012.

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