Atmos. Chem. Phys. Discuss., 13, C4452–C4454, 2013
www.atmos-chem-phys-discuss.net/13/C4452/2013/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Pauci ex tanto numero: reducing redundancy in multi-model ensembles" *by* E. Solazzo et al.

Anonymous Referee #3

Received and published: 3 July 2013

Review of the paper Pauci ex tanto numero: reducing redundancy in multi-model ensembles by Solazzo et al.

General comments

The paper addresses the fundamental issue of member diversity in multi-model ensembles. As the authors state, to date no attempts in this direction are documented within the air quality (AQ) community. Especially the issues of common biases and redundancy deriving from lack of independence, undermining the significance of a multi-model ensemble is handled by the paper. As stated in the abstract: Shared biases among models will determine a biased ensemble, making therefore essential the errors of the ensemble members to be independent so that bias can cancel out. Redundancy

derives from having too large a portion of common variance among the members of the ensemble, producing overconfidence in the predictions and underestimation of the uncertainty. This is a very important issue within multi-model ensembles and to my knowledge it has not been handled before for AQ models. The basis for the analysis is the data from the AQMEII inter-comparison study. The AQMEII data constitutes model results from the present state-of-the-art models in North America and Europe, and most be considered the best dataset available for the study. The paper is within the focus of ACP. The paper is well written and well structured. The paper contains a smaller review of what have been done in the area until now and make references to appropriate literature. The basic starting point in the paper is that atmospheric models contains the same kind of errors since the models are based on identical level of understanding of physical, chemical processes and numerical methods. Therefore, the results from the models are not independent. This is an interesting and important issue when making model ensembles using a multi-model approach. The methodology used in the paper is scientifically sound. I therefore recommend publication in ACP.

It is kind of funny that the authors chose a Latin expression in the title. Normally, I would say that a title should be easy to understand, and as most people do not understand Latin, this criterion is not fulfilled. However, the Latin expression also potentially turns on the curiosity of the potential reader and therefore I will not suggest the authors to avoid Latin expressions in a title. Especially, when the expression is relevant.

I have not found any part of the paper for specific comments. The argumentation and methodology in the paper is convincing.

Technical corrections

Even though I tried, I only found the following two typos:

P 4995, line 13: we apply a number of member selection criterion - > we apply a number of member selection criteria

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13, C4452–C4454, 2013

Line 15: non- redundant -> non-redundant

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 4989, 2013.