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Interactive comment on "Ensemble Forecasts of Air Quality in Eastern China – Part 1. Model Description and Implementation of the MarcoPolo-Panda Prediction System" *by* Guy P. Brasseur et al.

Anonymous Referee #1

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This paper describes an interesting approach to develop ensemble air quality forecasting systems. Specifically, it describes the outcome of 2 EU projects that produced an ensemble forecast system of opportunity. This approach takes existing models developed and applied elsewhere and brought together under this project to produce a forecasting system. Each model member was free to use their inputs of choice (emissions etc.,), This approach is described here and demonstrates how this can be done in a rather direct manner to produce a system. This approach in principal is reproducible in any region as the models can be applied anywhere and global emission esti-

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Discussion paper

mates and meteorological inputs are available globally. This paper is a straight-forward description of the modeling system. It includes the necessary descriptions of the individual models, inputs used, and how the ensembles were generated. The paper then presents a series of illustrative results focused on model predictions and performance for March 2017. These results are interesting and informative – showing cases where the ensemble performs well and cases where the models and ensemble have difficulty. Other results show some insights into why the models behave differently. Quantitative statistical results are presented on for a 2-week period of March. The limitation of the paper is that the results presented are only illustrative and for a single month. The paper is Part 1 implying that there will be additional papers submitted. It would be helpful to state in the paper what follow-on papers are being considered. This will help clarify the scope of this part 1 paper. Presumably a more rigorous evaluation will be presented in another paper based on at least an entire year. The paper includes discussion of limitations and potential ways to improve the forecasting system, which is informative. In summary this paper presents an interesting new prediction system for which the approach is applicable in other regions. This warrants publishing. I offer a few comments below for consideration. The references are pretty Europe centric. Section starting on line 137 could consider adding an earlier reference to ensembles McKeen, S. et al., Assessment of an ensemble of seven real-time ozone forecasts over Eastern North America during the summer of 2004, J. Geophys. Res., 110, D21307, doi: 10.1029/2005JD008888, 2005 I suggest adding a separate section on model evaluation. What systematic evaluations are performed, what data is used, how the data was made available, are their plans in the system for retrospective evaluation (say every year using additional data (not available in real time) and finalized data, etc., This is an important component of a forecast system. It would be interesting to present lessons learned – about establishing such a system in another region. What guidance can be given?

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