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## ***Interactive comment on “Variational data assimilation for the optimized ozone initial state and the short-time forecasting” by S.-Y. Park et al.***

**Anonymous Referee #2**

Received and published: 15 November 2015

The theme of the paper is relevant. It is dedicated to variational methods for assimilation of chemical data. The authors focused on optimization of the initial state and short-term forecasting of ozone behavior. The article contains new results relating to joint use of models and observational data about the ozone distribution in the capital region of South Korea. In particular, it should be noted the prospects of using more real covariance matrices. The authors concluded that the methods of data assimilation are among the main tools in predicting chemical weather. It is shown that optimization of the initial conditions significantly improves the quality of the forecast compared with the model without assimilation. In the new version of the text, the references to previous research are given correctly. Numerical experiments are described in sufficient detail. The title fits the content of the paper. The abstract reflects the main results. We

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would agree with the authors that their work is a preliminary study aimed at a further improvement in the prediction of chemical weather. In this context, the main remark is that the authors considered the ozone solely. We have not seen how the optimized initial ozone data change the concentrations of other chemical components involved in the model. The refinement of which data can improve the quality of forecast?

Overall, the paper contains some interesting practical results and should be published in ACP.

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Interactive comment on Atmos. Chem. Phys. Discuss., 15, 28167, 2015.

ACPD

15, C9278–C9279, 2015

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