

## ***Interactive comment on* “Implementation and testing of a simple data assimilation algorithm in the regional air pollution forecast model, DEOM” by J. Frydendall et al.**

### **Anonymous Referee #2**

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#### General Comments

This manuscript presents an implementation and tests of a simple data assimilation procedure to improve surface ozone forecasts. The results are presented clearly and in a well organized manner, and the conclusions drawn are sound and supported by the analysis presented. The main weakness of the presented work resides in the innovation introduced by implementing and testing statistical interpolation to improve analysis and forecasts of surface ozone. Prior to publication, the author must clearly specify which aspects of the presented material are novel in the field.

#### Specific Comments

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Page 7646, Line 20: define "chemical weather". Page 7646, Line 26/Page 7647 Lines 1-9. This statement needs to be clarified (if not deleted). "Chemical weather" prediction accuracy does depend on the meteorology driving the dispersion and chemical processes. If weather forecasts need data assimilation to produce accurate forecasts, so do air quality predictions, since the weather component is a fundamental aspect of it. In fact this statement seems to contradict what stated at Page 7648, Lines 6-9. Please clarify. Page 7647, Line 5: "long range", specify. Page 7647, line 11: "half a decade". Provide a reference. Page 7649, Lines 13-17. The three-layer modeling approach should be better explained/justified since at first sounds as quite a technical limitation. Page 7649, Lines 17-18: "good results" (line 18) should be substitute with a more specific statement, and it should be briefly described which kind of models where included in the inter-comparison studies. Page 7650, Line 13: is 40 km "high resolution"? Page 7652: "personal communication". The authors should find a peer-reviewed reference to back-up this statement. Page 7652, Line 19: "Given the wind...". Where? Page 7655, Line 23. A map with the spatial distribution of the observations would be useful. Page 7656, lines 18-20. Give briefly the rational for selecting the listed experiments. Page 7657, Lines 13-16. Give briefly the rational for selecting the listed strategies. Page 7658, Lines 5-7. Give briefly the rational for selecting these metrics. Page 7659, Line 16-17. Have the authors explained how these weights are determined?

## Technical corrections

Page 7650, line 9: missing "." at the end? Page 7658, line 20. experiment 9 or 8? Page 7658, Line 21. Correct "determininge". Page 7660, line 3. The authors should make sure that in all figures the axes have the same ranges for consistency and to allow the reader to more easily interpret the results. Also the authors should check the captions of all the figures with multiple panels where at time top and bottom seems to be confused with left and right. Page 7660, Line 15. Change "!" to ".".

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