

Interactive comment on “Sensitivity of ensemble Lagrangian reconstructions to assimilated wind time step resolution” by I. Pizzo et al.

Anonymous Referee #1

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This short paper describes how improvements in the temporal resolution of wind fields can improve the reconstruction of the structures seen in a vertical ozone profile by diffusive trajectory calculations. The method used is sound and interesting but it is not entirely new and has been used before by the same authors. My main concern about the paper is what we can learn from the reconstruction of a single ozone profile. The method would be well suited for a statistical analysis using, for instance, several thousand ozone profiles in different regions and at different times of the year. I doubt, though, that much can be concluded from a single case that may or may not be representative. Therefore, unfortunately, I cannot recommend the paper to be published in ACP, unless the authors can add more cases and present more robust statistics.

Other points:

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Page 8620, line 13: Sutton (1994) and Norton (1994) may have been early studies on trajectory calculations in the stratosphere but there have been many earlier studies on trajectory calculations in the troposphere, which are probably more relevant to issues mentioned in this paragraph (environmental and nuclear risk management). There also exists a large body of literature on how the temporal resolution of wind fields influences the accuracy of trajectory calculations, which the authors do not seem to be aware of.

Section 2.2: How long are the back trajectories? This information is missing.

Section 2.2: Why has the spatial resolution been increased for the hourly output fields? This makes it impossible to separate improvements due to the higher spatial resolution from improvements due to the higher temporal resolution.

Fig. 2: I think the last row of figures bears a wrong labeling. It should be $D=1 \text{ m}^2\text{s}^{-1}$ instead of $D=0.5 \text{ m}^2\text{s}^{-1}$.

I find it somewhat irritating how the figure panels are arranged in Fig. 1 and 2. Rows in Fig. 1 correspond to columns in Fig. 2 and vice versa. This should be made consistent.

Language:

Page 8624, line 13: than -> compared to

Page 8625, line 13: I do not understand what you mean with “the supports of the clouds”. Actually, this entire paragraph is difficult to read.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 8619, 2009.

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