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Atmospheric Chemistry and Physics Discussions

Interactive comment on "A review of the Match technique as applied to AASE-2/EASOE and SOLVE/THESEO 2000" *by* G. A. Morris et al.

Anonymous Referee #2

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General remarks

This is the first time that this method to determine ozone loss is introduced to the literature. Under these circumstances, the description and the discussion here is too short. The most important points where more information is needed are the following:

- Somewhat more detail on how exactly the method works should be given (see below).
- The results from the trajectory mapping approach should be compared with those deduced from other studies, most importantly of course with those from the "Morris et al." version of Match. I believe a clear statement is required whether the two

methods are giving consistent results or if there are discrepancies. For example, the ozone loss rate for 500 K in the year 2000 shows a very different behaviour, and very different numerical values for TM and the "Morris et al." version of Match. Can these differences really be explained by the "taking into account all sources of error inherent in both approaches"?

- For Match some test calculations on the consistency of the results with theoretical expectations were conducted. An important point is whether the method diagnoses ozone loss in darkness. How much ozone loss in darkness is deduced using the trajectory mapping approach?

Detailed comments

p. 4963, l. 14. What is the maximum length of the employed trajectories. I assume they could be rather long. Are trajectories of such a length really meaningful for the purpose used here? That is, do they still describe the original air parcel?

p. 4963, l. 20-25. I believe a figure of the type of Fig. 9 would be helpful to allow the reader to assess the validity of the method.

p. 4963, l. 27. How exactly is the ozone loss calculated? Are again the average of 200 subsets of 50 percent of the data used? If yes, is 200 enough given that the sample is presumably much larger than for Match?

p. 4964, l. 9. I cannot agree that the results of the trajectory mapping approach always show less variability in the average ozone loss rates than the Match approach. For example, in Fig. 12 the ozone loss rate changes rapidly at the end of February and shortly before February 10; it even changes sign shortly before January 20. Is this supposed to be a realistic result? If yes, what could be a reason for such a rapid change in the ozone loss rate?

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p. 4964, l. 20. Is a constant ozone loss rate expected for this period?

Figures: The label 'Morris' is used in the Figures for both The TM-Match and "our version of Match". I suggest to use something like 'Morris-TM' in the Figures in this chapter.

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 4665, 2004.

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Interactive Comment