Atmos. Chem. Phys. Discuss., 9, C8232–C8233, 2009
www.atmos-chem-phys-discuss.net/9/C8232/2009/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Source identification of short-lived air pollutants in the Arctic using statistical analysis of measurement data and particle dispersion model output" *by* D. Hirdman et al.

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Received and published: 11 December 2009

We thank referee #1 for the positive comments on our paper.

Regarding the choice of the time period used for our analysis, these are the 8 most recent years with available measurement data. The exact duration of this period is certainly somewhat arbitrary. It is a compromise between using a time interval that should be as long as possible for the results to be robust and statistically significant, but at the same time, a time interval that should not encompass substantial trends

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or changes of source regions. The analysis assumes that source areas and source strengths do not change throughout the period under consideration and this would certainly not be valid for a time interval that is much longer. We also want our results to be relevant for the current situation, hence the choice of the most recent period.

We are working on another paper that will analyze trends over the last two decades. While we only have preliminary source region results, the transport climatologies for these 20 years for Alert and Barrow are very similar to those obtained for the 8-year period studied in the present paper (Fig. 1). Thus, the transport conditions of our 8-year period are representative of a longer period. It is too early to say how source regions have changed during such a long period but since concentrations have decreased substantially, source strengths have certainly changed.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 19879, 2009.