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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Transport analysis of ozone enhancement in Southern Ontario during BAQS-Met" *by* H. He et al.

Anonymous Referee #3

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This manuscript presents an analysis of a nice ozonesonde data set collected from southeast Canada in summer. The data are analyzed using good modeling techniques to search for influence of stratospheric intrusions. While much of the analysis is sound, I cannot recommend the paper for publication in ACP because it lacks originality and does not make a substantial contribution to scientific progress.

The Introduction is not clear as to what the purpose of the paper should be, with the last paragraph only listing the outline of the paper. What scientific questions are the authors trying to answer?

From reading the paper it seems the main points are 1) that stratospheric intrusions occur frequently in summer over eastern North America, which runs counter to the idea that they are more active in spring, and 2) that these intrusions while introducing a lot

of ozone into the upper and mid-troposphere make little impact at the surface. Both of these topics have already been covered well in the literature.

I have to dispute the authors' finding that the observation of several stratospheric intrusions in a short campaign in high summer is surprising (page 15572 lines 8-9). While several modelling studies have shown a greater flux of stratospheric ozone into the troposphere in spring there is plenty of evidence that stratospheric intrusions are common summer (or even early autumn) events, as shown by these studies over North America: Johnson and Viezee, 1981; Bachmeier et al., 1994; Moody et al. 1996; Thompson et al., 2007.

The finding that on average very little ozone impacts the surface of southeastern Canada, very close to the US border, is also not a substantially new finding as previous studies have found the same thing, with Fiore et al [2002] being a very good example. As I mentioned above the authors appear to have a nice data set and good analytical tools, but in order to publish the results in ACP they need to use the data and tools to answer a unique science question.

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Interactive comment on Atmos. Chem. Phys. Discuss., 10, 15559, 2010.