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Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "Investigation of the formaldehyde differential absorption cross section at high and low spectral resolution in the simulation chamber SAPHIR" *by* T. Brauers et al.

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We would like to thank the anonymous referee for the detailed review of our manuscript. Initiated through the referee's comment on Figures 2 and 3 and the related text we re-analyzed the data of Aug 10. We realized that there was a drift on the BB-DOAS instrument which is not covered by the even larger error bars of this day. Since the error bars of this day were large, the contribution to the weighted regression was small. However, we excluded this day from the analysis and prepared new Figures 2 and 3. As a consequence the difference between the summer and winter data is more pronounced. We calculated separate correlation and regression lines for the 2 days. We also included data points during the flushing of the chamber which were excluded in the first version. These data points support the finding as seen in Figure 3. In the

following we will answer step by step his/her comments.

1. The differential cross section is a scaling parameter for the calculation of concentrations from the measured differential optical density (absorbance). The multi-channels scanning technique (MCST) and the OH-DOAS instrument were described in a number of papers which we cite. Therefore, we do not want to extend the manuscript with details of the instrument.

2. The spectroscopy and details of the spectra recorded with the HR-DOAS instrument (including the MCST) was described in detail in the Hausmann et al. 1997 paper. In that paper we explain in how the MCST and the resolution of the instrument modifies the narrow absorption lines of OH and the contribution of this procedure to the accuracy of the measurement. We added a sentence in the experimental section to emphasize the findings of that paper. Figure 1 has now clearly marked the wavelength triple which is used for the calculation of the differential optical density.

3. We removed the data of Aug 10 and analyzed the two remaining days independently. We added a Table with the respective results and clearly stated the a possible temperature effect consistent with the Cantrell et al (1990) paper.

4. A sensitivity statement is made in the text. We added a sentence that an independent measurement of this rate would be useful.

5. The absorbance (optical density) shown in Figure 1 are in units of $10^{-3}$. The axis title was changed accordingly.

6. The data recorded on Aug 10 were affected by technical problems with the BB-DOAS instrument. Therefore we excluded this day from the analysis.

7. The manuscript was changed in line with the minor comments. We changed Figures 3 and 5 and their captions according to the suggestions of the referee.



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