

## ***Interactive comment on “Comparison of OH reactivity measurements in the atmospheric simulation chamber SAPHIR” by Hendrik Fuchs et al.***

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We thank the reviewer for the helpful comments.

**Comment:** Both FZJ instruments should be briefly introduced in section 3.2. The FZJS instrument is used as the reference for the measurement with secondary reactions. It will be helpful to state the reason of the choice in more detail.

**Response:** All LP-LIF instruments are described together in Section 3.2. and differences between instruments are mentioned in the text. Subsections for the Lille and Leeds instruments are only describing the procedure how data were revised. Because

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this was not the case for the FZJ instrument, we do not think that a separate subsection for the FZJ instruments is needed.

The FZJS instrument was chosen as reference due to its good data coverage and high precision for experiments where it was not possible to calculate the OH reactivity. This was, for example, the case when the gas mixture in the chamber was exposed to solar radiation, and unmeasured products were formed. There are no other reasons than already described in the manuscript. Because the regression analysis takes errors in both coordinates into account, results are independent on the choice of the reference as stated on p17.

**Comment:** The accuracy and the precision of PSU LIF instrument used in the inter-comparison was not as good as other LIF-based instrument. In line 18 on Page 15, the authors stated the reason was probably due to the dilution flow and the interference could be at least a factor of 5. More explanation will be expected, either in the paper or in the supplement materials.

**Response:** A similar question was raised in the first review and we would like to refer to our answer there. We think that there is no need for further explanation in the manuscript, because differences between the operation during this campaign and previous campaigns and the consequences for the measurement results are explained at various locations in the manuscript.

**Comment:** The sampling flow rates are quite different for all the instrument. The flow rates of DWD-CIMS and LP-LIF/FT-LIF are 2280 LPM and 10 to 20 LPM which the sample flow of CRM from SAPHIR chamber is not mentioned. Will it cause any interference on the measurement results?

**Response:** Sampling flow rate are listed in Table 1 for all instruments as well as the residence times in the inlet lines between chamber and instruments. As discussed for example on p23, the choice of material of the inlet line, residence time, temperature and surface to volume ratio of the inlet line potentially influence losses of OH reactants

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in the inlet line.

**Comment:** The summary and conclusion gives a few nice points on various technology. It will be helpful if this sections can be separated into several parts.

**Response:** We will divide this part into a subsection "Summary of findings" and "Conclusions for future instrument operation and measurements in the past".

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