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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Photolysis frequency measurement techniques: results of a comparison within the ACCENT project" *by* B. Bohn et al.

B. Bohn et al.

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Reply to referee 2

We thank referee 2 for the positive evaluation and the thorough review with many suggestions for improvements. In the revised manuscript we shall make all suggested changes. In particular we added some statements as recommended and listed below. Page and line numbers refer to the paper published in Atmos. Chem. Phys. Discuss. 8, 10301-10352, 2008.

1) On page 10305, line 9 we inserted a statement and re-worded the following paragraph:

The accuracy of photolysis frequency measurements based on Eq. (2) depends on both accurate spectral actinic flux and molecular parameters. However, the uncertain-

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ties of the molecular parameters are not the scope of the present work. Previous field measurement studies combining chemical actinometry and spectroradiometry have pointed to errors in molecular parameters (e.g. Müller et al., 1995; Shetter et al., 1996) but they can only be quantified through laboratory studies. The question addressed in this work was if different instruments and measurement techniques produce consistent photolysis frequency results based on common sets of molecular parameters.

2) On page 10305, line 25 we inserted a statement on the necessary spectral resolution:

Spectral resolutions of 1 nm are generally sufficient for measurements aiming at photolysis frequencies. However, this is not a strict rule and depends on the wavelength range, the photolysis process and the desired accuracy (Hofzumahaus et al., 1999).

3) On page 10311, line 23 we added a sentence on the total uncertainty of IUP-SR:

We therefore estimate a further 5% uncertainty for the measurements of IUP-SR. Total uncertainties may thus cumulate to 10-30%, dependent on conditions.

4) On page 10314, line 9 we now make a general statement on the accuracy of the FR in the experimental section and refer to the results section:

Accuracy estimates for filter radiometers are difficult because they depend on the accuracy of the reference method used for calibration. Moreover, instrument specific long-term drifts or spectral response properties may lead to time and condition dependent uncertainties (see Sect. 3.2 for more details).

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 10301, 2008.