

Interactive comment on “Comparison of OH concentration measurements by DOAS and LIF during SAPHIR chamber experiments at high OH reactivity and low NO concentration” by H. Fuchs et al.

Anonymous Referee #3

Received and published: 1 May 2012

This paper presents measurements of OH radicals produced in the SAPHIR chamber using both Laser-Induced Fluorescence (LIF) and Differential Optical Absorption Spectroscopy (DOAS) under conditions similar to that observed during the PRIDE-PRD2006 campaign in the Pearl River Delta, China. The overall goal of these measurements is to determine whether the high OH concentrations observed during PRIDE-PRD2006 were due to an instrument artifact. Because DOAS OH measurements are generally regarded as free from interferences and do not require calibration, agreement between the LIF and DOAS measurements is a strong indicator in the accuracy of the LIF mea-

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surement technique. This is an important area of research, as previous measurements of OH radicals under low NO_x conditions are significantly greater than predicted by current atmospheric chemistry models, which brings into question the accuracy of these OH measurements.

The authors attempt to simulate the concentration of several individual VOCs observed during the 2006 campaign such as isoprene and its oxidation products (primarily methyl vinyl ketone and methacrolein) as well as several aromatic compounds in order to determine whether the oxidation of these compounds interferes with the measurement of OH by the LIF technique. In general, the OH concentration measured by the LIF technique are in good agreement with the DOAS measurements, although there may be a small potential interference associated with the oxidation of MVK and toluene.

The agreement between the DOAS measurements with the LIF measurements gives confidence that the discrepancy between the OH measurements by the LIF technique and the model observed during the PRIDE-PRD2006 campaign is likely not due to an interference with the measurement. However, these results are specific to the conditions encountered during PRIDE-PRD2006, and do not rule out the potential for interferences with OH measurements under different conditions.

The paper is very well written and suitable for publication in AMT after the authors have addressed the following comments.

1) The authors state that the NO concentrations were determined by the photostationary state between O₃ and NO₂. Did the authors assume that deviations from the photostationary state by peroxy radicals were zero? Did the measurements of peroxy radicals confirm the assumption? This should be clarified.

2) Although the authors state that peroxy radicals were measured during the experiment, there is no discussion of the measurements. Were the measured concentrations similar to what was measured during PRIDE-PRD2006? If not, what implications do the measurements have on the applicability of these chamber experiments to the cam-

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paign conditions?

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 2077, 2012.

AMTD

5, C852–C854, 2012

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