

## ***Interactive comment on “Detection of HO<sub>2</sub> by laser-induced fluorescence: calibration and interferences from RO<sub>2</sub> radicals” by H. Fuchs et al.***

**H. Fuchs et al.**

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We apologize for not having answered this question in our first response.

**Comment:** It is unclear from the paper whether the hydrocarbons are added to the calibration gas mixture before the Hg lamp or after it. In Fuchs et al 2008, in which the RO<sub>2</sub> measurement technique which uses the conversion of RO<sub>2</sub> into HO<sub>2</sub> followed by detection of HO<sub>2</sub> using the chemical conversion method with NO is described, it would seem that the parent hydrocarbons are added before the lamp. If this is the case, the authors should discuss possible photolysis of the alkenes in this present study which may lead to the formation of RO<sub>2</sub> or HO<sub>2</sub> and impact on the interference measurements. Ethene for example might be expected to undergo some photolysis to generate an H atom which then generates HO<sub>2</sub> quickly in air. Previous studies (e.g. Giroux et al.,

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Can. J. Chem. 67, 1166, 1989, and many others) discuss yields of H atoms at 193 nm, and there have been studies at 185 nm. It may be difficult to distinguish between an HO<sub>2</sub> interference from RO<sub>2</sub> decomposition and photolytic sources of HO<sub>2</sub>.

**Response:** The hydrocarbons were added to the gas before it reached the photolysis region, as mentioned in Fuchs et al. 2008. In that paper we discussed and excluded the relevance of photolytical radical production from the 185 nm photolysis of isoprene. In the present work, we tested all hydrocarbons listed in Table 2 by feeding the calibration source with a mixture of the corresponding hydrocarbon and dry air, avoiding radical production by water vapor photolysis. In no case, a significant radical production from hydrocarbon photolysis could be detected by LIF.

We will add in the manuscript on page 1265 line 26: "Since hydrocarbons were added upstream of the photolysis region of the radical source, photolysis of these hydrocarbons at 185nm may occur (Demers et al. 1978, Giroux et al. 1989). In order to test for effects of photolysis on experiments conducted here, the fluorescence signal was measured, when hydrocarbons were mixed in dry air, so that radicals are only produced by photolysis of the hydrocarbon. No significant radical production from hydrocarbon photolysis could be detected by LIF."

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Interactive comment on Atmos. Meas. Tech. Discuss., 4, 1255, 2011.

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