

## ***Interactive comment on “Comparison of different real time VOC measurement techniques in a ponderosa pine forest” by L. Kaser et al.***

### **Anonymous Referee #1**

Received and published: 18 December 2012

Dear Editor,

Please find attached my remarks on manuscript "Comparison of different real time VOC measurement techniques in a ponderosa pine forest. Kaser et al. Atmos. Chem. Phys. Discuss., 12, 1–34, 2012 version 4.

The manuscript has been improved since version 1. This manuscript presents interesting results in an organized way. It covers important issues on the measurements of VOCs by proton transfer reaction mass spectrometry supported with chromatographic analyses.

In order to improved the manuscript, find my remarks and comments below.

Page 5, line 2: “co-located measurement”: Please add a few words on the horizontal

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distribution of the measurement towers.

Page 6, line 4: This paper clearly is a VOC measurement intercomparison. Please include a reference of an accompanying paper to read more on the atmospheric interpretation of these data.

Page 6, line 6: Does “summer of 2010” refer to the period of August 10 to August 21?

Page 6, line 20: Please provide details on the atmospheric conditions (precipitation, history of the air mass,... for the data under discussion here ( 10/08 - 21/08) or include a reference that covers these topics.

Page 7, line 8: Was all tubing of equal length for the gradient system?

Page 7, line 9: comma misuse: “A second (eddy-covariance, EC) inlet was used. . .”

Page 7: please, state to flow through all inlet lines. Has the residence time in the tubing been calculated and taken into account for the instrumental intercomparison?

Page 8, line 18: limits of detection (LOD) were determined from the 2 sigma. Why not 3 sigma? LOD refers to the lowest quantity of a substance that can be distinguished from the absence of that substance thus the background signal. The background signals were scarcely recorded for some of the instruments used in this study for a thorough background evaluation and interpolation over the course of time. Please comment.

Page 11, line 23: please, add a short description on how the LOD has been calculated for the TOGA as the 2 sigma-rule applied to determine the LOD of the PTR-(TOF)-MS cannot be not apply to chromatographic methods in the same manner.

Page 13, line 20: please, describe how the whole air samples were obtained. Have the canisters been evacuated and then filled up to atmospheric pressure? Or filled with overpressure? How have they been stored (temperature controlled ? how much time was there between sampling and analysis ? Which instrument has been used to analyze them? Include the calibration procedure.

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Page 14, line 4: I'm wondering why the correlation coefficient  $R$ , which is measures for the strength and the direction of a linear relationship between two variables, has been chosen over the coefficient of determination  $R^2$  which represents the percent of the data that is the closest to the line of best fit.

Page 14, line 22: please, provide details on the diurnal and nocturnal boundary layer conditions (depth, sunrise, sunset, humidity, clouds,. . .) or refer to an accompanying paper that discusses these issues for this field study.

Page 17, line 8: It is known in the literature that the concentration of isoprene and other reactive compounds are not stable in canisters which have been stored.

Page 17, line 13: The PTRMS has been measuring the gradient in the forest at high time resolution compared to the TOGA but is not used in the discussion here. That's odd. Furthermore, with an EC system on site a very good filter can be made to subdivide the data set into periods during for which advection and convection dominated. Please comment.

Page 17, line 18: as OH concentrations are not under discussion here, please refer to the paper that describes these measurements for this study. Then, mention here the concentration range for OH and O<sub>3</sub> measured during this study and perhaps add a reference which includes the calculation of the photochemical age.

Page 29 Table 1: to complete the table, I suggest including the measurement frequency and the frequency of the background analyses.

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 27955, 2012.

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