

## ***Interactive comment on “Design of a mobile aerosol research laboratory and data processing tools for effective stationary and mobile field measurements” by F. Drewnick et al.***

**Anonymous Referee #1**

Received and published: 16 April 2012

This paper presents a mobile laboratory built for air quality monitoring of gas and particle pollutants. Overall this is a very useful “tool” containing a large suite of instruments useful for studying local and regional air quality issues. Clearly a lot of effort went into the design. There are several comments listed below that should be addressed.

The MOLA is presented as having the capability of making measurement while mobile and Figure 9 shows some high time resolution CO<sub>2</sub> data for mobile (and stationary) periods. However, it is difficult to view the highly time resolved measurements shown here (and in Figure 7). The authors should present some results of other measured species (beyond CO<sub>2</sub>) demonstrating the capabilities of fast time resolved measure-

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ment for gas and particles. A figure (or two) showing correlations, perhaps with CO<sub>2</sub> or CO, would be supportive. Something that shows the near 1 Hz measurements would really help illustrate the capability and utility of this system.

Such a correlation would also address the discussion presented in section 6.3 “Local Contamination Effects and Filtering Methods”. Would not a scatter plot of a gas or particle pollutant versus CO<sub>2</sub> be a means to separate the local perturbations from background levels?

The second sentence in the abstract states “Major efforts were made to design an aerosol inlet system which is optimized and characterized for both, stationary and mobile measurements”. I guess what the authors mean by “characterized” is by modeling only. Were any measurements performed to support these calculations? If not this should be clearly stated.

pg. 2276 line 20 references other mobile lab measurements of megacities. Please add the following references:

S. C. Herndon, J. H. Shorter, M. S. Zahniser, J. Wormhoudt, D. D. Nelson, K. L. Demerjian, C. E. Kolb *Environ. Sci. Technol.* 2005, 39, 7984–7990

S. C. Herndon, J. T. Jayne, M. S. Zahniser, D. R. Worsnop, B. Knighton, E. Alwine, B. K. Lamb, M. Zavala, D. D. Nelson, J. B. McManus, J. H. Shorter, M. R. Canagaratna, T. B. Onasch, C. E. Kolb, *Faraday Discuss.*, 2005, 130, 327–339.

Figure 5 is mostly illegible as presented; maybe consider omitting this figure or presenting it schematically.

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Interactive comment on Atmos. Meas. Tech. Discuss., 5, 2273, 2012.

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