Atmos. Meas. Tech. Discuss., 4, C1639–C1640, 2011
www.atmos-meas-tech-discuss.net/4/C1639/2011/

Atmospheric Measurement Techniques Discussions

Interactive comment on "Interferences of commercial NO_2 instruments in the urban atmosphere and in a smog chamber" *by* G. Villena et al.

Anonymous Referee #2

Received and published: 22 September 2011

Authors describe both positive and negative interferences of commercial NO2 instrument in highly polluted conditions (tunnels and smog chambers). The first section of the manuscript dealing with the problems with chemiluminescence instruments with molybdenum NO2 converters does not represent a new contribution to scientific progress. Problems with molybdenum converters have been known for over 40 years. Similarly, the detailed discussions of problems with Luminol NO2 instrument is equally irrelevant as this technique has not be used by atmospheric scientists for many years given the numerous well understood interferences with this NO2 measurement technique.

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Interactive Discussion
Discussion Paper

The only "new" results presented in the manuscript relate to the performance of the 3 instruments: NO2-LOPAP, chemiluminescence-blue light converter (CL-BLC), and FTIR in a smog chamber. Specifically, the new finding is an interesting hypothesis on why a single channel NO/NOx CL-BLC would under predict calculated NO2 in highly to extremely polluted conditions. These conditions require high the photolysis of glyoxal leading to the production of HO2 and OH, which can directly (or indirectly via OH reactions with alkanes and alkenes) convert NO to NO2 in the BLC chamber.

While this is an interesting phenomenon, I disagree with the authors that this potential artifact has any significant importance in the "real" world outside of tunnels and smog chambers. Atmospheric measurements with CL-BLC and one of the selective spectroscopic techniques (DOAS, LIF, CRDS, etc) showing real-world importance of this HO2/RO2 NO2 artifact would be a substantial scientific finding. Without having to resort to a new study, a agree with reviewer #1 that box model calculations of this NO2 artifact using real-world levels (from published rural and urban studies) of NO, NO2, O3, glyoxal, alkanes, alkenes, etc would help prove the potential significance of this artifact.

Interactive comment on Atmos. Meas. Tech. Discuss., 4, 4269, 2011.