

Interactive comment on “Interferences of commercial NO₂ instruments in the urban atmosphere and in a smog chamber” by G. Villena et al.

Anonymous Referee #1

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This paper discusses the interferences observed in measurements of nitrogen dioxide (NO₂) by different instruments. A number of data sets taken over many different years and field projects are used to demonstrate both positive and negative interferences in NO₂ data under mostly polluted conditions, some extremely so. The discussion revisits some well-known problems with NO₂ measurements by the luminol and photolysis-chemiluminescence (P-CL) techniques and presents data on a previously unreported problem with the latter method. The paper is generally well-written with ample supporting literature cited and the figures are clear and to the point. However, I feel that the authors dwell too much on previously described interferences and not enough on what

is new.

I have the following recommendations: First, delete the entire discussion of the Santiago study, as well as Figure 1 and the description of the Mo-CLD instrument. This has been discussed sufficiently in the literature. Second, show the smog chamber correlation plots of [NO]+[glyoxal] vs [NO₂] via FTIR, which are important to the proposed P-CL interference mechanism. Finally, verify the proposed mechanism of the negative interference in the P-CL system with box modeling of the chemistry in the photolytic cells (both ECO and Ansyco). While the proposed explanation for this problem is plausible, box model results using data from the smog chamber study would provide a solid and quantitative understanding, and perhaps could provide information concerning the atmospheric levels when this would be a problem for given P-CL instrument conditions (e.g., wavelength(s) of lamp sources; cell residence times).

With the support from the modeling results and the other two changes, I can recommend that this paper be published in AMT.

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

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Discussion Paper

