Atmos. Meas. Tech. Discuss.,
doi:10.5194/amt-2017-339-RC1, 2017

Atmospheric Measurement Techniques Discussions

Interactive comment on "The BErkeley Atmospheric CO_2 Observation Network: Field Calibration and Evaluation of Low-cost Air Quality Sensors" *by* Jinsol Kim et al.

Anonymous Referee #1

Received and published: 25 October 2017

This article presents work from the deployment of low cost air quality sensors in high grid network around San Francisco Bay Area focusing mainly on alternative approach for field calibration of the low cost toxic gas sensors (CO, NO, NO2, O3) for some of the challenges described previously in literature. With the growing interest in the application of low cost sensors in air quality monitoring, the method presented here will add to the existing literature in this field. The manuscript is well written and the authors adequately describe their approach, validating the method by comparing to reference methods for the monitored gas species. I will like the authors to clarify a few points and some minor corrections outlined below.

Main comments

While most of the subsection in section 3 (Model for Field Calibration) are well presented, section 3.2 needs more clarification. What do the authors mean by "properly calibrated time derivative" in P6, line 24? Some of the description is not clear enough, lines 16-18.

As a general practice, I will like the authors to include the duration of the data used in generation the statistics and for some of the figures as this will allow the reader to put the result in context. For instance, Table 3, P21 shows the MAE of O3 without any information on the data period, none of these matches the 6.88 ppb MAE present for O3 in P9, line 9.

Can the authors explain why the O3 data shown in figure 8 appears to have a better noise < 11ppb (2σ) quoted for the lab tests? What are the temporal resolutions of the data presented in this figure? The reader will benefit if this information is included in figure caption or main text.

The authors need to clarify the VCO, VNO etc. in equations 1-4. Is this the voltage difference of the "working" and "auxiliary" electrodes or the just the "working" electrode.

Minor corrections

P.2, line 16, there is track change

P. 3, line 7: the Shusterman el al. reference is missing in the references.

P.4, lines 10-11: rewrite equations 3 and 4, suggest putting the cross interference terms (rNO-NO2 x NO ambient) in bracket.

P.9, line 7, this should read Eqn 5 not 7.

P14, add scale to figure 1, advise including image of deployed node in figure 2.

I suggest including the temperature plot in figure 8.

Several figures (Fig. 3, 4, 6 and 8) need to be replotted with legible axis labels.

A general comment, the authors should make sure numbers in chemical formulae are in subscript form.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2017-339, 2017.