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Atmospheric Measurement Techniques Discussions

Interactive comment on "Stationary and Portable Multipollutant Monitors for High Spatiotemporal Resolution Air Quality Studies including Online Calibration" *by* Colby Buehler et al.

Anonymous Referee #1

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"Stationary and Portable Multipollutant Monitors for High Spatiotemporal Resolution Air Quality Studies including Online Calibration"

General Comments

The manuscript presents low-cost air quality sensor unit for multipollutant, including toxic gases, particulate matter and greenhouse gases (carbon dioxide and methane). The authors report detailed characterisation of two variants of the device: stationary and portable version and present some preliminary results from few field studies. In addition to the characterising the devices, the authors present an online calibration method that rely on the use of traceable gas which is incorporated into the device

with auto-calibration functionality built into the operational software of device. This manuscript is well written and presents a new approach physical calibration approach that is more comprehensive than any other work in this field of low-cost air quality sensor. The manuscript also present recommendations on best practices related to design, characterising and deployment of this type of device.

Specific comments

The authors did not address the issue of safety for the online calibration system which relies on the use of pressurised calibration cylinder (1500 psig). Under normal ambient application, the static variant of the multipollutant device may be exposed to high temperatures especially in the summer. This could pose potential safety concern for the structural integrity of the device. The authors have reported using B431 Alphasense sensor for the OX (P. 3, line 93) but the Table 1 and the text in line 90 page 3 suggest A variant was used. In addition, the authors stated that the static variant uses MiCS-2614 for O3, does this mean the static and portable unit has both OX and O3 measurements? The authors need to clarify this ambiguity. I recommend the authors annotate figure 1(b) and figure S3 (a & b) with labels showing main components of the photo presented. Technical corrections (main manuscript) P. 10, line 297, the phrase ". . .by the Plantower sensor" sound like the authors are referring to the reference device rather than the MPM device Suggest something like ". . .. . .by the multipollutant device collocated with the reference at the Baltimore Oldtown" P. 17, line 491: there is a red font in the text. P. 17, line 494: remove the "of" in the sentence. P. 23, line 625 (Figure 3 (a)) add the RH/T corrected to the legend of the time series. Ditto for figures 4(a) and 5(a) P. 25, figure 8 and 9 captions should include the dates for this deployment.

Technical corrections (supplementary information)

P. 4, line 85, the phrase ". . . Eqn S2 and Eqn S3" should read ". . . Eqn S3 and Eqn S4" P. 9, Figure S9 caption should include the temperature range for the two plots (< 18 and > 18 degree C).