

Review Comments on the Revised Manuscript

General comments

The authors have responded well to most of the comments from the reviewers. And the paper is much improved.

A few important issues remain that were not fully addressed in responses. These are covered in detail in the specific comments below. However, generally, there remains an issue with cold weather operations data/fittings and with comments/conclusions regarding the application of findings to other sensors/situations. This work was performed in a specific location in the US and essential data were collected during a period of summer and early fall. A specific brand of sensor cells was employed. These findings don't justify sweeping conclusions for application in other situations and with other sensor configurations. A further quick review is recommended following consideration of the points raised since the answers may impact the findings.

Page 3, line 4—the description includes the word “affordable” but nowhere in the text is the cost of the RAMP system (with all sensors) mentioned. These appear to be available for purchase from a company called “SenSevere”.

Line 4, line 8—I am not convinced that the role of temp/RH are well established in the study. While the authors responded to the earlier question with a statement that they ran “into October” and it was suggested to have similar conditions as winter a quick look at weather underground for the monthly average temp for October shows 54 degrees while January is 26. The humidity is also likely to vary far outside the range encountered during summer/early fall months. Our experience with Alphasense based sensors is that these differences are important. Basically it appears that a great deal of good data are reported and used from the limited period, but the cold months (which may have differing RH) are untested. The authors need to explicitly discuss this and what they may know about cold period operations. The exact date of the range of operations should also be presented.

Responses to earlier questions direct one to see figure 7 to demonstrate agreement during cold seasons, but this appears to show that performance is not equivalent between winter and warm season observations for NO₂. This difference is not discussed in the paper. For Ozone there does not appear to be very much actual cold season operation and one would also expect quite low ozone in any case, to help judge model fitting.

Are these platforms heated or is internal temperature measured/reported? What temp/RH data are used in fittings?

Does the present data set and modelling support the overall summary statements regarding the suitability of the model results/application advice in the middle of page 9 which did not include cold season data?

Page 5, line 32—There are several monitoring platforms based on “low cost sensor” being used/sold. While many use Alphasense sensors, others are used as well. A bit more care is needed with the general statement regarding application of methods to unspecific low cost electrochemical sensors. They may or may not respond the same.

Page 20, line one—the observation/finding that specific fitting models work well “when applied to data collected at new sites” seems a bit overstated based on the very limited geographical/meteorological diversity studied here.

Line 10—the statement which proposes the reason for good data quality is proposed as “This suggests that the primary difference between these monitors, i.e. the internal circuitry which is unique to the RAMP, is the cause for this consistency” but there seems to be no description of the circuitry to justify this statement. Is it based on Alphasense reference circuitry or some other improved design. Please expand and support this statement or remove it. Perhaps the circuitry might be described in the methods section.

Page 21—line 4. All work reported is from Alphasense B4 sensors. Is it clear that the finding and recommendations made in this study apply to all electrochemical cells?

Page 22, line 15. Conclusions. It seems unwise, based on the reports from this study that sensor responses may drop by half over a year, to only calibrate on an annual basis. This is a lot of sensor “drift”! It is unclear that the rate of decay is linear and that methods exist to determine calibration factors over the course of the year. Further discussion and data are needed on this.