

Interactive comment on “Long-term evaluation of air sensor technology under ambient conditions in Denver, Colorado” by Stephen Feinberg et al.

Stephen Feinberg et al.

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Reviewer Comment 1: The authors have compared mass concentrations with number concentration for some of the devices, I suggest removing the information on slope and intercept from the Table 3 as this is not informative but can mislead the reader with regards to the performance of these units.

Author Response 1: We feel that the slopes and intercepts demonstrate potential variability in sensor response. It is informative to know whether slopes and intercepts from different sensors of the same type are consistent.

Reviewer Comment 2: It will help if the authors give more information on how the PM_{2.5} are calculated by the various manufacturers for the devices reporting this unit

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of measurement, including the size range each measured.

Author Response 2: We don't know the algorithms behind many of the sensors' reported concentrations or particle counts, as they tend to be proprietary information.

Reviewer Comment 3: I am not sure the section describing the comparison of the high-time resolution of the device with respect to the reference unit is well described. Will having a time series plot of the 1-minute data from all devices (PM/ref PM and O₃/ref O₃) albeit for 24-hour period complement the conclusion drawn by this analysis?

Author Response 3: We have clarified the language for Figure 6. We don't believe showing a sample time period will help show this conclusion, as this analysis is based on overall measurement to measurement variation at one-minute time scales.

Reviewer Comment 4: With regards to the difference in trend patterns (time/wind), have the authors considered the impact of the RH diurnal cycle on the PM sensors. Typically, high RH are observed at night-times, this may be masked in the wind trend analysis (high RH randomly spread across the wind directions). It is worth checking the time trend analysis using periods of low RH (say < 50%).

Author Response 4: We have explored examining RH (and temperature) as a cause of this difference; however, we were not able to explain the differences with these parameters. We have added text to the discussion explaining that we explored this avenue.

Reviewer Comment 5: Technical corrections P.2, line 19, add “was” after the phrase “the sensors” P. 5, line 118: what do the authors mean by “. . . challenge concentrations. . .” P. 6, line 149-150 rephrase “. . . the clause removing wind-blown snow”

Author Response 5: We have made these corrections in the text.