Atmos. Meas. Tech. Discuss.,
doi:10.5194/amt-2019-158-RC2, 2019

Atmospheric Measurement Techniques Discussions
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Interactive comment on "Characterising low-cost sensors in highly portable platforms to quantify personal exposure in diverse environments" *by* Lia Chatzidiakou et al.

Anonymous Referee #2

Received and published: 11 June 2019

This manuscript presented results for their portable personal air quality monitor (PAM) measurements in outdoor, indoor and commuting microenvironments across seasons and in different geographic areas between UK and China. Overall the paper is well written with sufficient technical details, and in an area that of interest of AMT.

There are many sensor studies worldwide in recent years, which evaluated sensor performance with FRM/FEM methods, or intra-/inter-sensor variability, or in different microenvironments in real-world settings. The novelty of this manuscript by comparing and presenting co-locating sensor measurement results is not significant. Also by reading the literature review part, I feel like the manuscript missed some important ci-

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Discussion paper

tations such as from US EPA for sensor evaluation studies in ambient environments. However, this manuscript gets my attention when it says it is the first of a series of publications that aim to relate personal exposures to health outcomes. There are many sensor measurement studies, but seldom have been used to link with exposure and health studies. I would be interested to see more results for microenvironments other than outdoor. Results presented so far in this manuscript for indoor and commuting are limited.

The R2 from the study are typically higher than what I learnt from existing studies, which might partly related with the calibration method they used. I would also like to see the comparison, maybe in appendix, between results not calibrated by environmental conditions such as temperature and humidity with reference instruments because many studies deploy their sensor without calibration prior to testing. It would be good if the manuscript can show the inclusion of temperature/relative humidity and cross-sensitivity from other gas greatly improves the R2. Also, how the calibration period was selected? Does the calibration period in the range of typical concentrations for all pollutant measured, and in the typical range for temperature/relative humidity?

For the commuting environment, measurements were taken on the vehicle roof. It should be noted that when evaluating personal exposure, people are usually sitting inside of vehicle. There is also a difference between in-vehicle personal exposure and outside-vehicle ambient concentration. When developing future publications, I suggest authors to consider this when evaluating measurements for commuting microenvironment.

Specially, Page 2, line 20-23: suggest including more references Page 3, line 22-24: suggest including price for individual sensors as readers might be interested Page 9, table 3: why R2 is only 0.20 for NO2 and NO in Chine during non-heating season? The results do not seem to agree well with other results.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2019-158, 2019.