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Atmospheric Measurement Techniques Discussions

Interactive comment on "Finding candidate locations for aerosol pollution monitoring at street level using a data-driven methodology" *by* V. Moosavi et al.

Anonymous Referee #2

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This paper develops an empirical model approximating the relationship between urban parameters and aerosol data using Self Organising Map (SOM) method. The developed model in combination with clustering technique was later used to identify the optimum number and locations of measurement sites. This covers an important issue related to the measurements of aerosol concentrations and can potentially have implications particularly related to exposure assessment. Despite the limitations of this study, it has adequate quality to be published in AMT after addressing the issues stated below.

General comments:

1) The measurements are limited both in spatial and temporal scale which can question the representativeness of the model and its application. This limitation should be stated more clearly in the manuscript.

2) The measurements were taken at 1 and 10 second intervals, however, the rationale for using such a small interval needs to be elaborated specifically in relation to the response time of the instruments used. For instance, the manufacture claims a response time of around 9 seconds for TSI 3007 CPC (http://www.tsi.com/uploadedFiles/_Site_Root/Products/Literature/Spec_Sheets/3007_1930032.pdf). Even if we are optimistic enough to accept the manufacturer claim then how would you justify using 1 sec measurements interval? Ideally you should have tested the response time of the instruments yourself and then used the intervals based on that considering the study design.

3) I believe the measurement uncertainty needs to be taken into account as well, particularly, in studies dealing with the comparison of measurements at different sites such as this one. Often the instrumental measurement uncertainty in practice is much higher than what is claimed by the manufacturers (For instance see: http://pubs.acs.org/doi/abs/10.1021/es400041r). The instruments should have been tested before and during the measurement campaign to come up with a realistic estimate of the uncertainty in the measurements. It would be great to include such data, if available, to your analysis and interpretation.

4) The importance of this study could have been more clarified in the Introduction section by reviewing the literature and including studies related to the spatial variation of aerosol concentrations in urban area, particularly the ones related to the sites within close proximity. For example see the papers below

Moore, Katharine, et al. "Intra-community variability in total particle number concentrations in the San Pedro Harbor area (Los Angeles, California)." Aerosol Science and Technology 43.6 (2009): 587-603.

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Salimi, Farhad, et al. "Spatial variation of particle number concentration in school microscale environments and its impact on exposure assessment."Environmental science & technology 47.10 (2013): 5251-5258.

5) Are you able to provide a general recommendation about the location of the measurement sites based on your study? It can be beneficial for the readers of the manuscript who plan to design a study.

Specific comments:

6) Figure 1, what was the reason for selecting a single day? I recommend to illustrate the daily average and its 95% confidence interval for the whole measured data. It would give a more general trend.

7) Page 3323, lines 14-16: Is it usually the case anywhere or you are talking specifically about Singapore? Please clarify!

8) Page 3322, line 25: “monitoring” has been repeated twice, it is better to remove the second one.

9) Page 3324, line 14-15: I guess, the appropriate place of “,” is after “ground level” not after parameters.

10) Page 3327, line 3: What does “ARIMA” stand for?

11) Page 3327, line 7-9: this sentence needs to be re-written.

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 3321, 2015.