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Atmospheric Measurement Techniques Discussions

Interactive comment on "Strategies of Method Selection for Fine Scale $PM_{2.5}$ Mapping in Intra-Urban Area Under Crowdsourcing Monitoring" *by* Shan Xu et al.

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Anonymous Referee #3 Received and published: 4 February 2019 In this manuscript, the authors presented strategies of method selection for efficiently and effectively PM2.5 concentration mapping with increasing training sites based on a crowdsourcing sampling campaign. This study found that Ordinary Kriging (OK) interpolation performed best under conditions with non-peak traffic situation in lightpolluted period, the Universal Kriging (UK) modeling performed better for conditions with the peak traffic and relatively few sampling sites in heavy-polluted period, and the Land Use Regression (LUR) model demonstrated limited ability in the estimation PM2.5 concentrations

at very fine scale. Overall, the the manuscript is well-written and scientifically sounds good, and can be accepted after minor revision.The authors should really redefine all acronyms in conclusions. . .Conclusions should broadly read as if the reader hadn't read the rest of the paper. Thus, the authors reintroduce everything, including hypothesis and research plan.

Response: Thank you very much for your thoughtful comments and suggestions. The conclusions were changed as: This study presented strategies of method selection for efficient PM2.5 concentration mapping with an increasing number of training sites using crowdsourced monitoring. The results confirmed that PM2.5 concentrations in microenvironments varied across the intra-urban area in China's cities. These variations can be clearly disclosed by the crowdsourced PM2.5 sampling rather than the national air quality monitoring sites. The selection of models for fine scale PM2.5 concentration mapping should be adjusted with changing sampling and pollution circumstances. Generally, ordinary kriging (OK) interpolation performs the best in conditions with non-peak traffic situations in the light-polluted period, while regression kriging (RK) can perform better in the heavy-polluted period and conditions with peak traffic and relatively few sampling sites in the light-polluted period. Additionally, note that the LUR model demonstrates a limited ability in estimating PM2.5 concentrations at very fine scale in this study. This method selection strategy provides empirical evidence for the method selection of PM2.5 mapping using crowdsourced monitoring and a promising way to reduce the exposure risks for individuals in their daily lives.

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