

Atmos. Chem. Phys. Discuss., referee comment RC2
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Comment on acp-2021-625

Anonymous Referee #2

Referee comment on "Measurement report: Three years of size-resolved eddy-covariance particle number flux measurements in an urban environment" by Agnes Straaten and Stephan Weber, Atmos. Chem. Phys. Discuss.,
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General

This paper presents a unique long-term dataset of particle flux measurements between 10 nm and 200 nm. Findings indicate that the city is a net source of particles with minimal deposition occurring within the flux footprint and study duration. The duration of these measurements allows the authors to observe changes in flux over a variety of temporal scales: annual, seasonal, weekday/weekend, and daily. Wind sectors associated with higher traffic intensity are shown to have a larger upward flux than sectors containing lower traffic or green spaces. The structure of the paper is excellent and follows a very clear methodology of flux analysis. Complimentary measurements such as aerosol characterization and source apportionment techniques would be helpful to better understand the drivers of the observed fluxes and wind sector differences. I find this paper to be a good contribution to the existing literature. Only minor revisions are required before publication.

Specific Comments

L37 – Diel instead of diurnal might be more appropriate to indicate that the full 24 hour day is being referenced, not just the daytime hours.

L73 – Were the data logged on the same computer? If they were logged separately how were the computers clock-synced?

L78 – I am a little confused by the description of the sampling flow. Is the EEPS sampling at 10 L/min or is the bypass line sampling at 10 L/min? If it is the latter, I'm concerned that the laminar flow through the bypass line will introduce bias to the particle size distributions and lag time. Sample flow through the bypass line should be turbulent. Particle attenuation through the bypass line could be a substantial factor impacting these data.

L89 – How long is the bypass line, what is the estimated delay time between the inlet and the instrument?

Figure 1.0 – Is it possible to elaborate on green areas? Are these fields, forests, or parks?

L104 – How many particle number size distributions were gap filled and how many were discarded?

L112 – How well did the covariance maximization agree with the calculated time lag? Was covariance maximized for each flux period? The latter can introduce bias to the data.

L171 – Was the EEPS checked with a calibrated DMA to ensure sizing accuracy?

L203 – Similar to Figure 1.0, can you better define green area?

L285 to L297 – This section was challenging to follow. The reference to the figure helped, but I think some work could be done to really highlight the key observations that can be made from these wind-sector plots.