

## ***Interactive comment on “Spatiotemporal variation and trends of equivalent black carbon in the Helsinki metropolitan area in Finland” by Krista Luoma et al.***

### **Anonymous Referee #3**

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The article presents a long-term field study of BC, NO<sub>x</sub> and PM<sub>2.5</sub> at different locations in Finland. Measurements at 4 locations allow for statistical evaluation of long-term trends, which show statistically significant reduction in BC and NO<sub>x</sub>. The study concludes that the new vehicle emission standards are responsible for the reduction of traffic emissions. The article is well written and can be published in ACP with minor revisions (see below).

1. As noted by the authors, the pollutant concentrations depend both on emission rates and atmospheric dilution. To support the author claims it is critical to quantitatively assess the long-term meteorological trends, especially for wind speed (during winter)

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and nocturnal mixing height (during summer). The sensitivity of pollutant concentration to the meteorological parameters can be studied using a "BC versus wind speed plot" and "BC versus mixing height plot" (the same for NO<sub>x</sub> and PM<sub>2.5</sub>).

2. Authors claim that the detached housing areas are influenced by local wood-burning emissions, the assessment being supported by lower NO<sub>x</sub>/BC ratio at DH sites compared to TR sites. For the sites where Aethalometer was used (DH4 and DH5) the source contributions should be quantitatively assessed using wavelength dependence of the aerosol absorption (Sandradewi et al., 2008).

3. When comparing BC concentrations measured by MAAP at 637 nm and Aethalometer at 880 nm the wavelength dependence of the aerosol absorption should be taken into account (alternatively all measurements can be reported at the same wavelength). For the reader's convenience, please specify the measurement wavelength of the MAAP on Page 6 Line 12.

#### Reference

Sandradewi, J., Prévôt, A. S. H., Szidat, S., Perron, N., Alfarra, M. R., Lanz, V. A., Weingartner, E., and Baltensperger, U.: Using aerosol light absorption measurements for the quantitative determination of wood burning and traffic emission contributions to particulate matter, *Environ. Sci. Technol.*, 42, 3316–3323, doi:10.1021/es702253m, 2008.

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Interactive comment on *Atmos. Chem. Phys. Discuss.*, <https://doi.org/10.5194/acp-2020-201>, 2020.

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