

Interactive comment on “Variability of levels of PM, black carbon and particle number concentration in selected European cities” by C. Reche et al.

C. Reche et al.

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We greatly appreciate your clarifications. We will try to consider all your suggestions in detail.

1. ad 13. The authors reply: "since more BC than CO is expected to have been eliminated from atmosphere by deposition when measuring at a distance of the emission sources". Why is this so? a typical dry deposition velocity of CO is 0.03 cm/s and for 10-100nm (diameter) particles the deposition velocity varies between 0.1-0.01 cm/s. Is deposition the real reason?

REPLY: we agree with your comment and we have decided to change this discussion, C2428

the new paragraph is: "On the other hand, the variability of CO/BC ratio does not reflect the composition of the vehicle fleet in each city. Maximum values are recorded for BCN (235), while minimum values are obtained in MR (90). In LUG, NK, Bern and SCO values ranged between 143 and 188."

2. ad 19. "REPLY: The definition of S1 in page 8685 have been changed to "S1 is described as the minimum number of primary particles arising from vehicle exhaust emissions per each nanogram of ambient air BC". Still the word described is used, is this a definition or a description of how to interpret S1. Still I don't know how to calculate S1. I really would like to know. Calculate for every hour in the database (measured N)/(Measured BC) and S1 is the lowest value in the database and S2 the highest? If so this value is very sensitive to outliers. Please explain how to determine S1 and S2.

REPLY: The definition is now: "At any time and for all the stations, the N versus BC scatter plots are grouped between two defined lines with slopes S1 and S2 representing the minimum and maximum N/BC ratios, respectively (Figure S3). S1 is interpreted as the minimum number of primary particles arising from vehicle exhaust emissions per each nanogram of ambient air BC."

ad 15. I still do not understand how a 150 meter distance can introduce a time shift of hours?

REPLY: The reason is unknown, but probably related with a very local source affecting BC.

ad 26 "REPLY: We mean the accumulation of pollutants in the city from Monday to Friday: "This tendency increases from Monday to Friday due to the progressive accumulation of atmospheric pollutants in the cities." I find this hard to believe. Do the authors really mean that a fraction of the exhaust emissions will stay in the city all week, Surviving all deposition (that is already important on a 150 meter scale) and advection?

REPLY: The text has been modified: "This tendency increases from Monday to Friday due to highest emissions."

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