

## ***Interactive comment on “Black carbon concentration trends in Helsinki during 1996–2005” by L. Järvi et al.***

**L. Järvi et al.**

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We thank both reviewers for their careful reading and valuable comments. Below our responses are listed.

### **REFeree #1**

REF: The authors compare and evaluate selected data for four common time intervals. The selection of the common periods means an unnecessary reduction in the number of data available...

The data selection was made to get the campaigns more comparable since the data was very discontinuous especially in 1996–1997. Thus, the data reduction was not unnecessary, but vital for the campaign comparison and multiple variable analyses.

REF: ...In this way, they could also determine the seasonal variation of BC...

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In the revised version, the seasonal variations will be taken into account with a new figure (Fig. 3) and new paragraph 3.1, which introduces monthly boxplots for each measurement campaign and the seasonal variations.

REF:The authors are encouraged to change the title...

The title of the manuscript has been changed to be "Temporal variations in black carbon concentrations over different time scales in Helsinki during 1996-2005".

REF:The impact of domestic heating on the BC concentrations...

The effect of domestic heating is negligible at our site (Pakkanen et al. 2000, Atmos. Env.). A sentence about the effect of domestic heating is added to page 14268, line 18.

REF:It is understandable that the atmospheric concentrations and meteorological data were logarithmically transformed before the regression analysis. However, the authors should explain why they did the same for the traffic rate...

The logarithmic transformation for traffic rate was made for the same reasons as for other variables. The variables should be normally distributed in MLR models.

REF:...the emission factors of BC is not worked out satisfactory...

We agree that using the word emission factor is doubtful. Thus, it has been removed from the text and we rather use expression "vehicle number-scaled BC concentrations".

Specific comments:

Page 14267, line 4: fine-sized has been added Page 14267, line 19: conservative has been added

REFeree #2

REF:I am not confident about using the term "trend"...

We agree that the term trend is not the best possible and it has been removed from the

manuscript and replaced with more convenient expressions.

REF:However, it would be very useful to add some information on the seasonal variations...

In the revised version, the seasonal variations will be taken into account with a new figure (Fig. 3) and new paragraph 3.1.

REF:...In the current form of manuscript, the role of long-range transport is mentioned in a very vague way.

We have added more text about the LRT and importance of distant sources in MLR section.

Minor comments:

REF:Formation of BC requires combustion, so it cannot be formed from biogenic sources...

Forest fires are example of non-anthropogenic emissions.

REF:BC warms the atmosphere, but similar to greenhouse gases... The sentence "similar to greenhouse gases" on page 14267, line 11-12 has been removed.

Besides the previous corrections, the language of the manuscript has been improved.

With best regards, Leena Järvi

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Interactive comment on Atmos. Chem. Phys. Discuss., 7, 14265, 2007.