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Interactive comment on “Contribution of residential wood combustion to hourly winter aerosol in Northern Sweden determined by positive matrix factorization” by P. Krecl et al.

Anonymous Referee #2

Received and published: 16 April 2008

Referee comment to the paper of Krecl et al.

Contribution of residential wood combustion to hourly winter aerosol in Northern Sweden determined by positive matrix factorization (acpd-2008-0016)

General comments:

The paper addresses the timely topic of the contribution of residential wood combustion to aerosol concentration. Especially in Northern Europe there is an increasing interest in domestic wood heating as an alternative to fossil fuel and nuclear power since wood is renewable, sustainable and carbon dioxide neutral energy source. However, small-

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scale domestic wood combustion deteriorates the air quality and can be a risk factor for human health.

The paper of Krecl et al. demonstrates the large contribution of residential wood combustion to winter aerosol in Northern Sweden. Even though the paper seems to be the third paper of the series of papers characterizing the winter aerosol in Lycksele also this paper presents new data and novel tools for analyzing the data set. Additionally, the paper is well written and clear.

Specific comments:

Title: Since this paper presents also the contribution of traffic and long-range transport to hourly aerosol I suggest to add these sources to title as well.

Pages 5730–36; 2.2. Positive matrix factorization: PMF method has been characterized extensively since author argues that all of the procedural details used in PMF need to be shown. However, would it be possible to shorten Section 2.2?

Methodology: I suggest to add few sentences regarding multiple linear regression.

Page 5737, line 9; Does MLAC originate only from diesel cars? Any references?

Page 5738, line 18; Author suggests that factor 3 consist of two sources: local wood combustion and long-range transport. Can you see this from the size distribution of factor 3 (Fig. 4)? Can you assume that the size distribution of local RWC in factor 3 is similar to the size distribution of factor 2?

Page 5741, lines 12–16; By comparing the fraction of local RWC obtained in this study to that of Hedberg et al. (2006) suggests that the fraction is closer to possible maximum than minimum. Does this mean that the size distribution for RWC is bimodal? Does this agree with other studies?

Page 5741, line 16–23; How can you compare fossil total organic carbon to MLAC? I assume that MLAC, measured using an aethalometer, consists mostly of

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inorganic (elemental) carbon.

Technical corrections: Page 5730, line 4 and reference list; change Taaper to Tapper

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 5725, 2008.

ACPD

8, S1670–S1672, 2008

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