Geophysical Research Abstracts,
Vol. 10, EGU2008-A-05221, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-05221
EGU General Assembly 2008

Comparison of different wood smoke markers in ambient aerosol

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Residential wood combustion is increasingly being identified as a major contributor to air pollution at a number of sites in Switzerland and in other countries. A source apportionment method using the aethalometer light absorption parameters is applied to five winter campaigns at three sites in Switzerland: a village with high wood combustion activity in winter, an urban background site and a highway site. The particulate mass from traffic ($PM_{traffic}$) and woodburning (PM_{wb}) obtained with this model compared fairly well with results from the ^{14}C source apportionment method. PM_{wb} from the model is also compared to well known wood smoke markers such as anhydrosugars (levoglucosan and mannosan) and fine mode potassium, as well as to a marker recently suggested from the Aerodyne aerosol mass spectrometer (mass fragment m/z 60). Additionally the anhydrosugars were compared to the ^{14}C results and they are shown to be comparable to literature values from wood burning emission studies using different types of wood (hardwood, softwood). The levoglucosan to PM_{wb}

ratios varied much more strongly between the different campaigns compared to mannosan to PM_{wb} with a range of 1-1.5%. Possible uncertainty aspects for the various methods and markers are discussed.