Review of doctoral thesis:

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Source Apportionment of Sub-Micron Prague Aerosol from Combined Particle Number Size Distribution and Gaseous Composition Data by Bilinear Matrix Factorization

Presented thesis counts 92 pages of the written text accompanied with many graphical supplements and two annexes each with example of INI file for one sampling period. This thesis is divided into 5 chapters that as I have said are accompanied with many graphs that illustrate the solved problem and results.

The problem of PM or aerosol urban pollution is very topical especially when the emphasis is given to small sub-micron particles. These small particles together with some investigated gaseous pollution (e.g. ozone, SO_2, CO, NO_X or THC) can affect the health state of inhabitants living in the urban area in a very important and undesirable way. Thus it is necessary to know as much as possible about this particles, about their possible sources and apportionment. A possibility how to do this is a subject of this thesis.

The overview of the receptor modelling methods, description of the Prague area as the domain of interest where the method of matrix factorization was used and a brief description of the methodology of the Positive Matrix Factorization (PMF) is given in the first chapter.

The overview of literature that deals with this problem is a subject of the chapter two.

The third chapter describes with greater details measurements, location of measuring site and its surrounding, used devices and measured data. In this chapter both sampling periods are also described.

Results and their discussion are given in the fourth chapter. For both periods there are shown and discuss possible source profiles and distributions of the gaseous pollution and particle size categories into individual profile classes.

The fifth chapter brings a short recapitulation of the topic and the obtained results.

There are many interesting results contained in this work. But, on the other hand, one has to be very careful as the area where the measurement took part is the very complicated one. There is simultaneous impact of many factors like orography and presence of buildings that can affect the flow pattern very substantially. There is a number of local emission sources from the traffic ones to point sources of different categories and all of the are located in s very close neighbourhood of the point where the measurement took place.

As far as the thesis concerned I have several questions. As I do not work in the field of aerosol or particle pollution my question will deal mainly with meteorology. I would like to ask author for explaining in grater detail the figures IV.3 and IV.14 (wind roses) and I would like to know where the meteorological data (especially wind speed and wind direction) were measured? Also I would welcome more detailed description of the scatter plots IV.10 and IV.18 where the predicted and measured data are compared.

I can conclude that this thesis brings interesting information and results and shows the author's ability for scientific work. I recommend to accept this doctoral thesis for reviewing process and to evaluate it as the Ph.D. thesis.

In Prague, 16 March 2009   Doc. RNDr. Josef Brechler, CSc.