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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Hygroscopic growth of urban aerosol particles in Beijing (China) during wintertime: a comparison of three experimental methods" *by* J. Meier et al.

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This manuscript presents atmospheric measurements of aerosol particle hygroscopic properties using three different experimental methods. The data are valuable and well presented. The manuscript contains new novel scientific results. This a well prepared manuscript and should be published in ACP after considering the issues discussed in the following.

Major comment:

The hygroscopic growth factors as derived from different experiments are different in nature in terms of possibility to determine the degree of mixing (internal vs. external).

With this respect the H-TDMA gives the most detailed information while calculations based on chemical analysis of an impactor sample give only the average value assuming complete internal mixing. The third method has possibilities perhaps somewhere in between. This aspect is discussed in the manuscript, but needs some more attention.

I would recommend the following aspects to be included into the manuscript. i) the true GFs from H-TDMA measurements should be presented and discussed. In my opinion, some statistics of the growth factors would be useful as these urban measurements could be compared with other available data. ii) In addition, Some time series focusing on the measurement period could be presented. iii) As the H-TDMA data are calculated to obtain the average GF, the authors should discuss the uncertainty and potential errors related with the process should be analysed.

On page 7, left panel, line 23->: The GFs of less and more hygroscopic fractions are discussed and compared with earlier data (Swietlicki et al., 2008), but none of this data is presented. The comments above would help this as well.

Detailed comments

Section 3.2., equation 2: Could you motivate the equation? It is not obvious that the nf is put to third power and not GF.

Tables: Why do you use two type of table numbering (e.g. Table 05 and Table A1)?

Table A1: The first figure at column "Aerodynamic diameter" should have some range, e.g. <0.1.

Table A4: The column "D_p" should have a size range instead of a single diameter.

Fig. 07: Could you also include the H-TDMA data onto the subplots.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 6889, 2009.