

Interactive comment on “Closure between measured and modeled cloud condensation nuclei (CCN) using size-resolved aerosol compositions in downtown Toronto” by K. Broekhuizen et al.

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Received and published: 30 September 2005

The Authors provide a very interesting aerosol/CCN closure experiment exploiting the high time and size resolutions of the Aerodyne mass spectrometer (AMS). With this comment I would like to draw the attention of the Authors on two points which merit, in my opinion, a more extended discussion. 1) The Authors state that closure was essentially achieved during all four days of the experiment, as shown in Figure 5. However, the figure shows that the overall close correlation is essentially due to the days when medium-to-high concentrations were encountered, whereas on 5 Sept there was

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essentially no correlation between the estimated and measured CCN concentrations. This means that the aerosol/CCN closure was not achieved for the case when composition of the aerosol was dominated by the organic material (Figure 3). This is contrary to one of the main conclusions of the paper, i.e., the ability of the AMS to accurately characterise the aerosol organic composition for aerosol/CCN closure studies. 2) The Authors also conclude that the AMS is needed to provide sufficiently well resolved size distributions of the aerosol chemical components. This is based on the comparison of the AMS with a hypothetical impactor with the lowest stage collecting particles in the size range 0.05 - 0.3 μm . However, multistage impactors like MOUDI can provide a higher size resolution (i.e., about three stages in that specific size range). Therefore, the sensitivity study reported in the paper does not seem to provide real conclusions on this issue.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 6263, 2005.

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