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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Hygroscopic mixing state of urban aerosol derived from size-resolved cloud condensation nuclei measurements during the MEGAPOLI campaign in Paris" *by* Z. Jurányi et al.

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The authors would like to thank Referee #3 for reading and reviewing our paper.

Comment: Page 2042, Line12: Include a bit more information on the operation of the DMT- CCNc. The total flow rate, the sheath-to-aerosol ratio and the total scan time (D+SS).

Response: More details on the operation of the CCNC are added to the text:

"The SS in the CCNC was held constant during two diameter scans. However, sometimes only one out of the two diameters scans provided valid data whenever the SS

setpoint changed during a diameter scan due to imperfect time synchronization of DMA and CCNC."

"Particles having lower SScrit than the SS applied in the CCNC's activation column grow to supermicrometer sized droplets and are counted as CCN by the optical particle sizer downstream of the activation column"

"The temperature gradient to SS relationship for a total flow rate of 0.5L min-1 (1 to 10 sample-to-sheath flow ratio in the CCNC) was determined during. . ."

Comment: Page 2043, section 3.1: Include an equation for kappa-köhler theory.

Response: The requested equation is included in the manuscript now.

Comment: Page 2048, Line 1: Include a very brief description of the GF-probability distribution function (GF-PDF)

A brief description is included now where the GF-PDF is first mentioned. It reads:

"The GF-PDF of an aerosol sample describes the likelihood that a particle with a defined dry size exhibits a certain GF at the specified RH."

Comment: Page 2043, Section 2.2.3: what were the growth factor intervals chosen in the HTDMA- CCNc set-up.

Response: The GF range was selected to be 0.5-2.5, whereas the SS in the CCNC was between 0.1 and 1.7%. However, only a fraction of the data could be used to determine the SScrit(D,GF) values, where the activation was sufficiently captured (see section 3.2 for details). The details on the GF and SS intervals are now added to the text:

"The SS applied in the CCNC was very slowly stepped (21 setpoints of 40 min duration each; covering the SS range from 0.1-1.7%), such that normally a constant SS was applied while scanning through GFs with the second DMA of the HTDMA system at each dry diameter (300 s per scan covering the GF range from 0.5-2.5)."

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Comment: Page 2047, Section 3.2: Would it be possible to include a figure to explain the procedure that was performed to determine the SScrit(D, GF).

Response: A figure illustrating how SScrit(D, GF) was determined from the measurements is now added to the revised manuscript.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 2035, 2013.