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Characterizing the volatility and mixing state of ambient fine particles in the summer and winter of urban Beijing

Lu Chen et al.

Correspondence to: Fang Zhang (zhangfang2021@hit.edu.cn)

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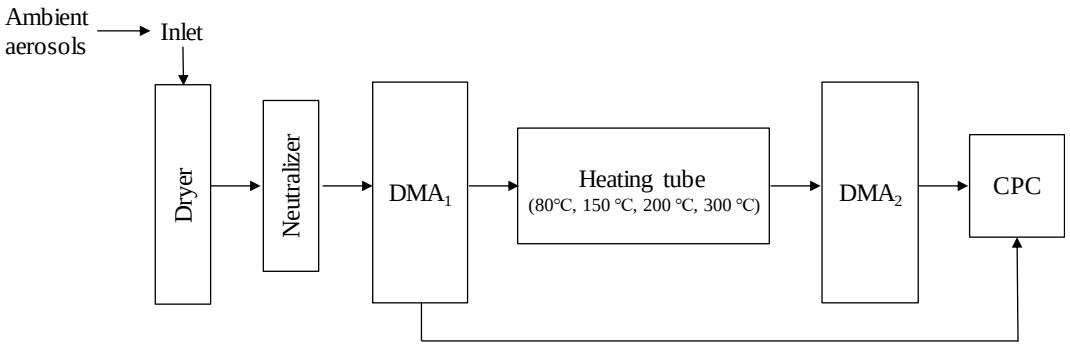


Figure S1. A schematic diagram of the volatility tandem differential mobility analyzer (VTDMA).

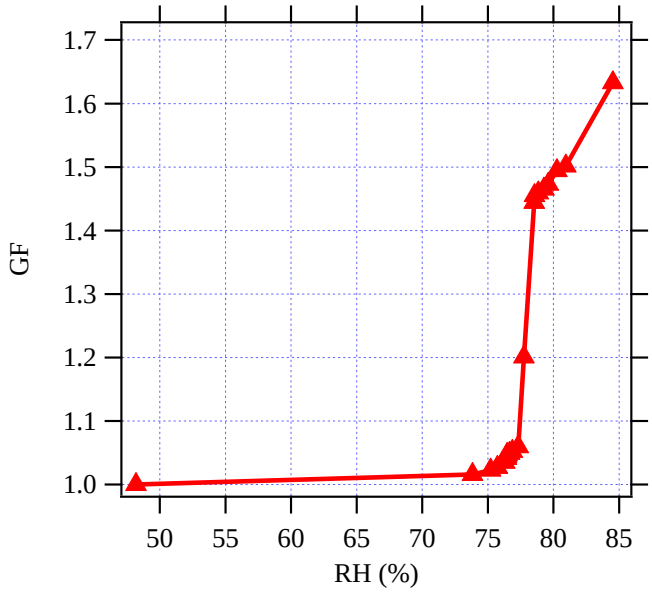


Figure S2. The hygroscopic growth factor (GF) of 150 nm $(NH_4)_2SO_4$ particles in different relative humidities (RH). The sudden jump in the GFs near RH 80% denotes the deliquescence RH.

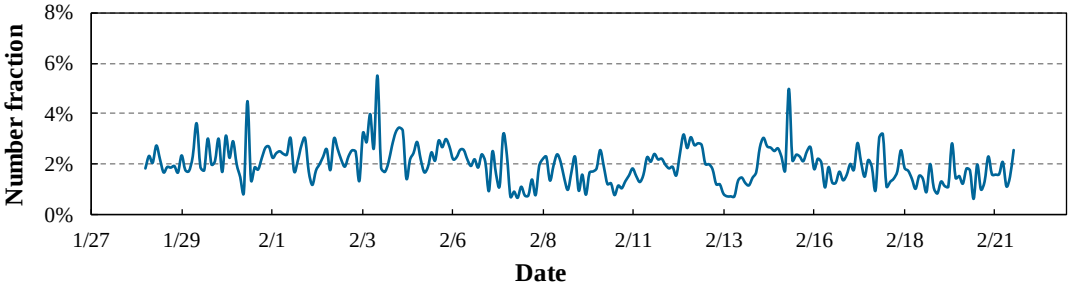


Figure S3. Temporal variation of number fractions of completely vaporized particles during the winter periods.

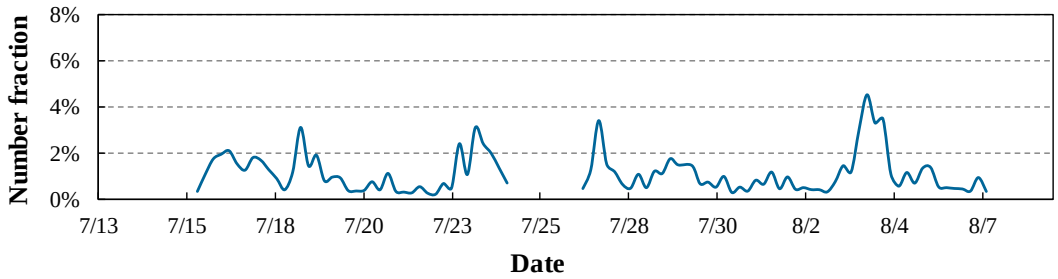


Figure S4. Temporal variation of number fractions of completely vaporized particles during the summer periods.

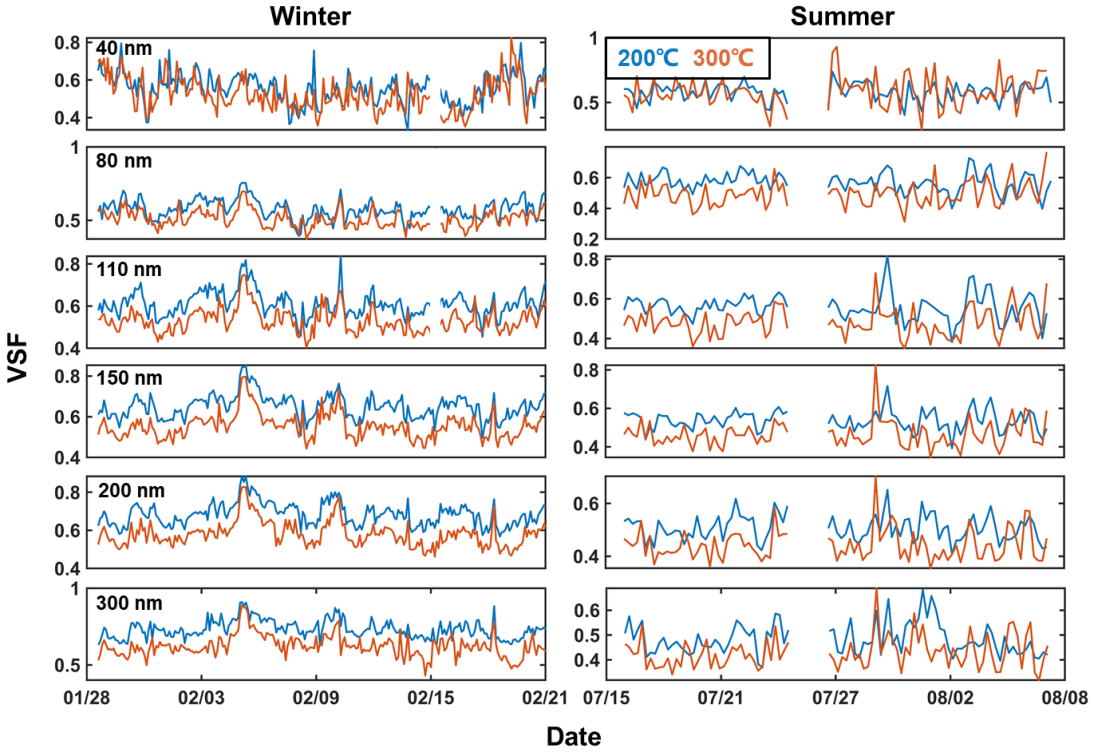


Figure S5. The mean volatility shrink factor (VSF) of all measured size particles after heating at 200 (blue line) and 300 °C (red line) during the winter and summer periods.

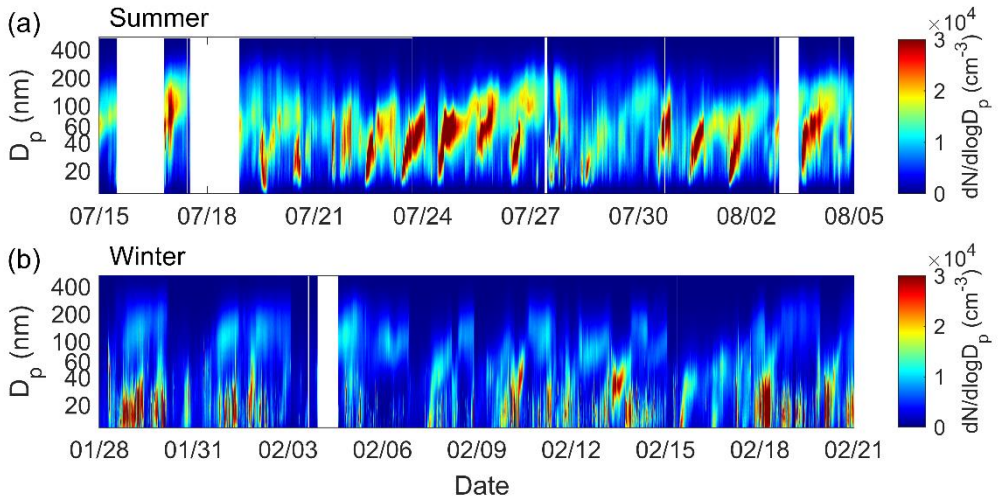
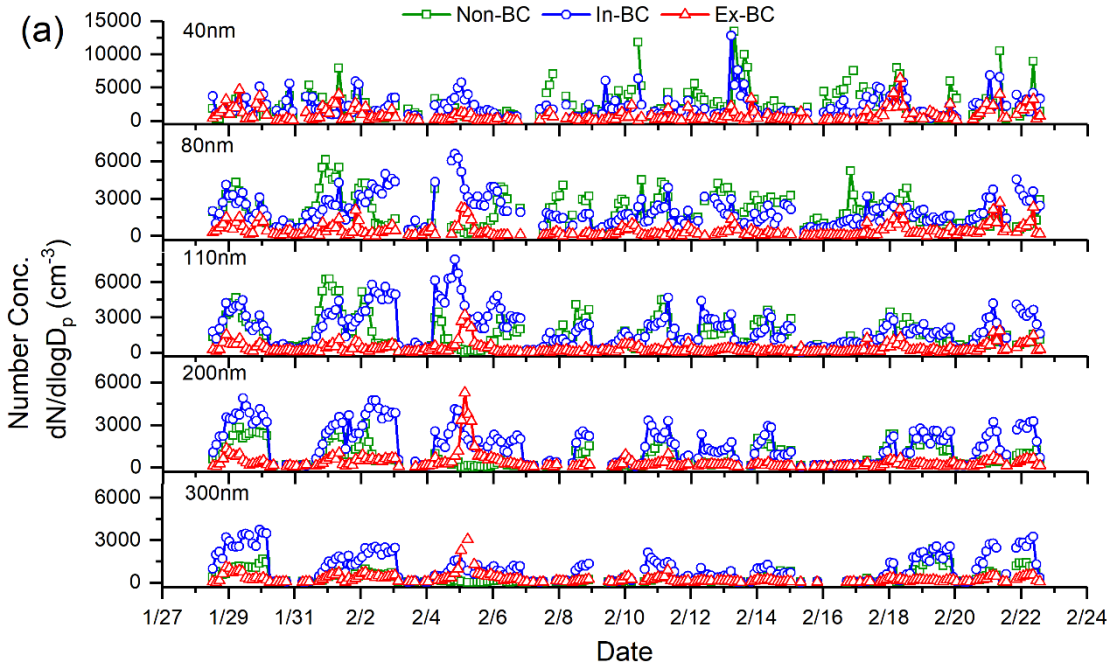


Figure S6. Time series of the aerosol particle number size distribution measured by the SMPS during the **(a)** summer and **(b)** winter periods.



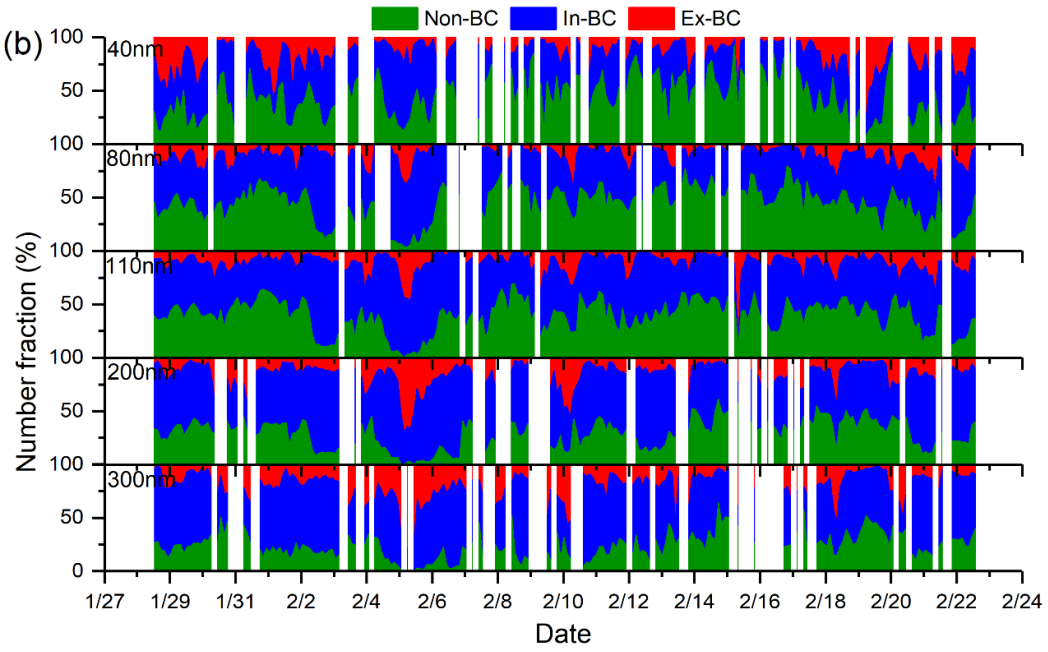
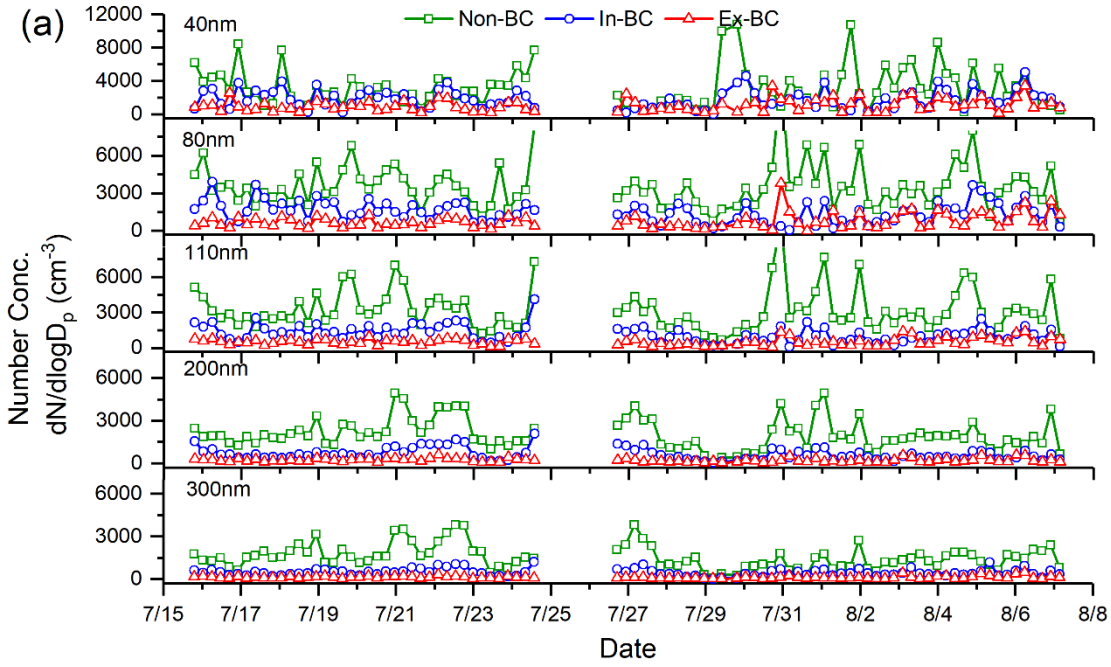


Figure S7. Temporal variation of **(a)** number concentrations and **(b)** number fractions of Non-BC (in green), In-BC (in blue), and Ex-BC (in red) in the range of 40-300 nm particles during the winter periods.



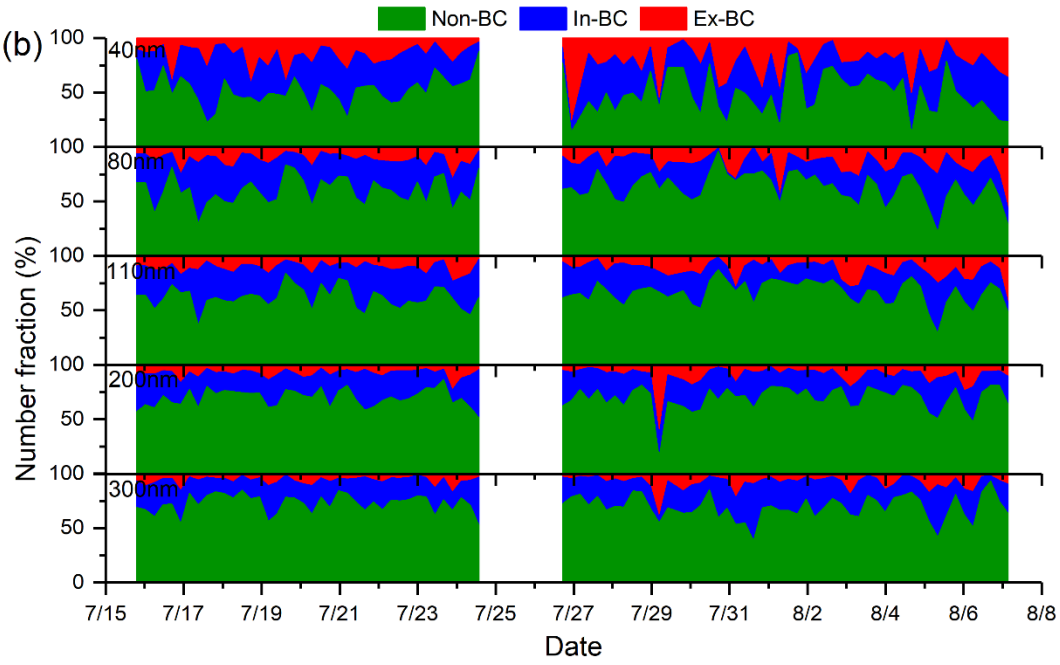


Figure S8. Temporal variation of **(a)** number concentrations and **(b)** number fractions of Non-BC (in green), In-BC (in blue), and Ex-BC (in red) in the range of 40-300 nm particles during the summer periods.

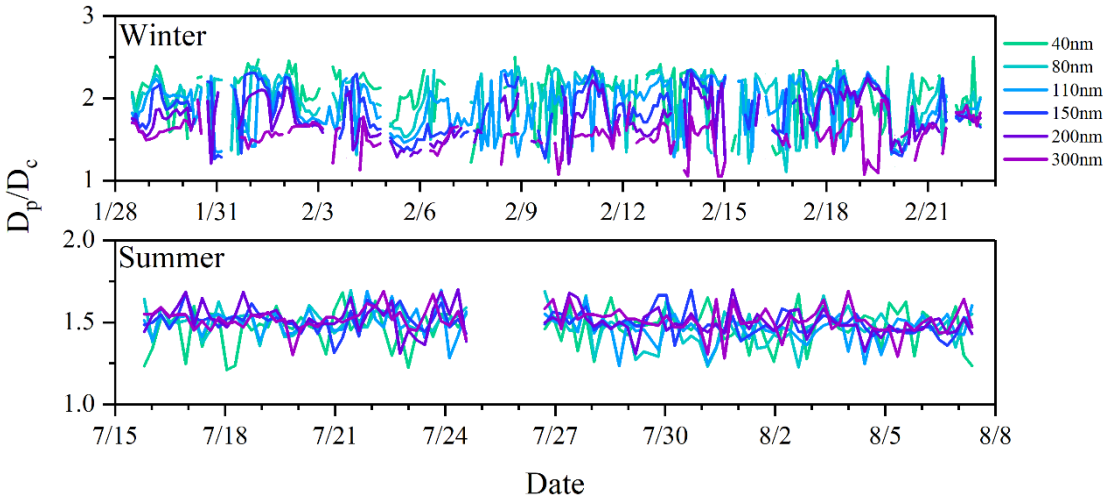


Figure S9. Time series of the size-dependent D_p/D_c ratio during the winter and summer periods.