Supporting Information for

Significantly enhanced aerosol CCN activity and number concentrations by nucleation-initiated haze events: a case study in urban Beijing

Fang Zhang[1*], Jingye Ren[1], Tianyi Fan[1], Lu Chen[1], Weiqi Xu[2, 3], Yele Sun[2, 3], Renyi Zhang[4], Jieyao Liu[1], Sihui Jiang[1], Xiaoai Jin[1], Hao Wu[1], Shangze Li[1], Maureen C. Cribb[5], and Zhanqing Li[1, 5*]

[1]College of Global Change and Earth System Science, Beijing Normal University, Beijing 100875, China,
[2]State Key Laboratory of Atmospheric Boundary Layer Physics and Atmospheric Chemistry, Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing, China,
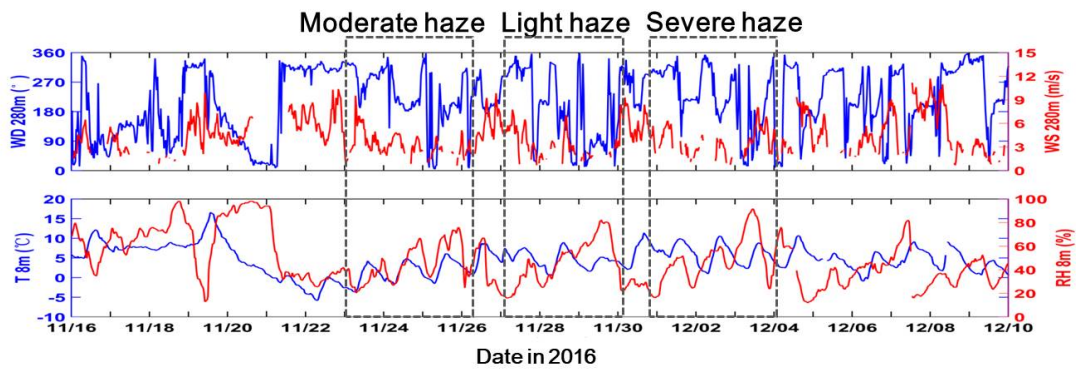*[3]University of Chinese Academy of Sciences, Beijing, China,*
*[4]Department of Atmospheric Sciences, Texas A&M University, College Station, TX, USA,*
[5]Earth System Science Interdisciplinary Center and Department of Atmospheric and Oceanic Science, University of Maryland, College Park, MD, USA

Contents of this file
    Figures S1 to S2, Table S1

Figure S1 Horizontal wind direction (WD) and wind speed (WS) measured 280 m above the ground, and ambient temperature (T) and relative humidity (RH) measured 8 m above the ground. Data are from 16 November to 10 December 2016.
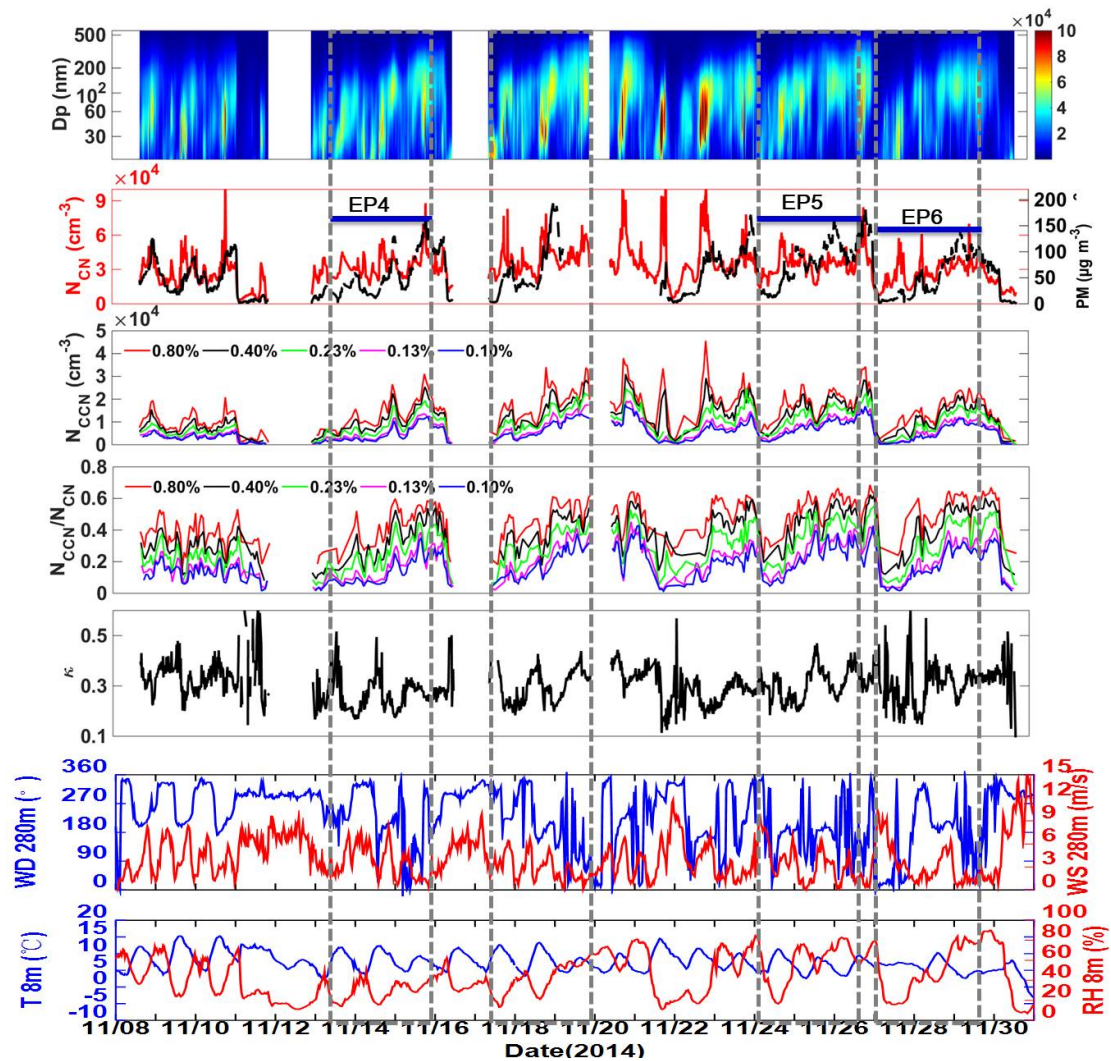
Figure S2 Time series of the (from top to bottom) particle number size distribution, particle number concentration (N_{CN}) and particle mass concentration (PM_1), CCN number concentration (N_{CCN}), ratio N_{CCN}/N_{CN}, particle hygroscopic parameter (κ) calculated from chemical composition, horizontal wind direction (WD) and wind speed (WS) measured 280 m above the ground, and ambient temperature (T) and relative humidity (RH) measured 8 m above the ground. Data are from 08 November to 05 December 2014. The different colors of N_{CCN} and N_{CCN}/N_{CN} denote results measured at different supersaturation levels: 0.12% (in blue), 0.14% (in magenta), 0.23% (in green), 0.40% (in black), and 0.76% (in red). Three haze episodes (EP4, EP5, and EP6) are selected for further investigation.

Table S1 Calculated enhanced factors from clean to heavily polluted conditions for each haze episode

2016	Enhanced factors from clean to heavily polluted conditions		
	EP1	EP2	EP3
N_{CN}	1.0	2.0	2.9
PM1	22.1	17.6	49.6
N_{CCN}（0.76%）	2.7	3.4	6.5
N_{CCN}（0.23%）	5.9	9.7	17.3
AR（0.76%）	2.7	2.0	2.1
AR（0.23%）	5.8	4.7	6.2
κ	1.4	1.2	1.3
D_{peak}	5.2	3.4	6.0
2014			
N_{CN}	1.9	1.8	1.1
PM1	8.0	7.5	6.2
N_{CCN}（0.76%）	4.6	3.1	2.2
N_{CCN}（0.23%）	6.7	4.2	5.3
AR（0.76%）	2.4	1.8	1.9
AR（0.23%）	3.8	2.3	4.2
κ	1.1	1.1	1.4
D_{peak}	4.8	3.1	3.5