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The important roles of surface tension and growth rate in the contribution of new particle formation (NPF) to cloud condensation nuclei (CCN) number concentration: evidence from field measurements in southern China

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Table S1. The input parameters in case 1-9.

"2 ×"and "0.5 ×" represent doubling and halfling the parameter, respectively.

	GR	J	PNSD	$\sigma_{s/a}$ (N m^{-1})	κ
Case 1	2 ×	1 ×	1 ×	0.0728	Measured
Case 2	1 ×	1 ×	1 ×	0.030	Measured
Case 3	1 ×	1 ×	1 ×	0.0728	1.2
Case 4	1 ×	2 ×	1 ×	0.0728	Measured
Case 5	1 ×	1 ×	1 ×	0.065	Measured
Case 6	1 ×	1 ×	1 ×	0.0728	0.15
Case 7	1 ×	1 ×	0.5 ×	0.0728	Measured
Case 8	1 ×	1 ×	1 ×	0.067	Measured
Case 9	1 ×	1 ×	1 ×	0.0728	0.13

Table S2. The growth rate and CS of background particle distributions during different NPF events.

	2019.10.18 Heshan	2019.10.29 Heshan	2014.12.12 Panyu
Growth Rate ($nm\ h^{-1}$)	10:00-14:00: 12.1 14:00-20:00: 3.5	10:00-20:00: 8.0	11:00-14:00: 6.1 14:00-20:00: 3.5
CS (s^{-1})	0.017	0.011	0.014

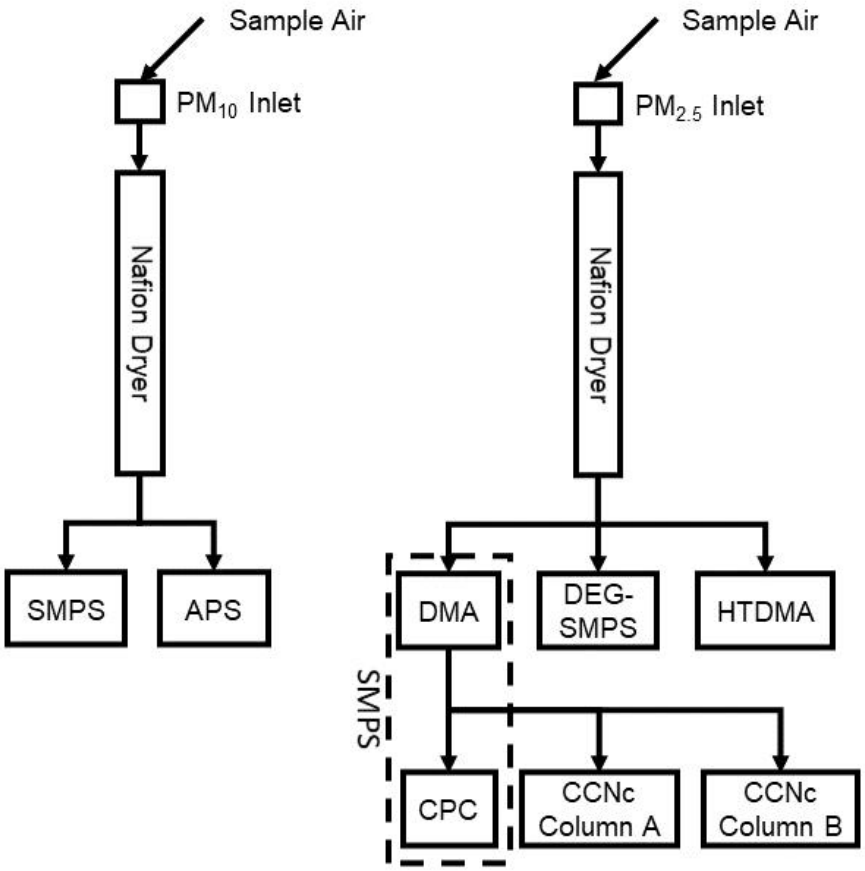

Figure S1. Schematic diagram of the experimental setup

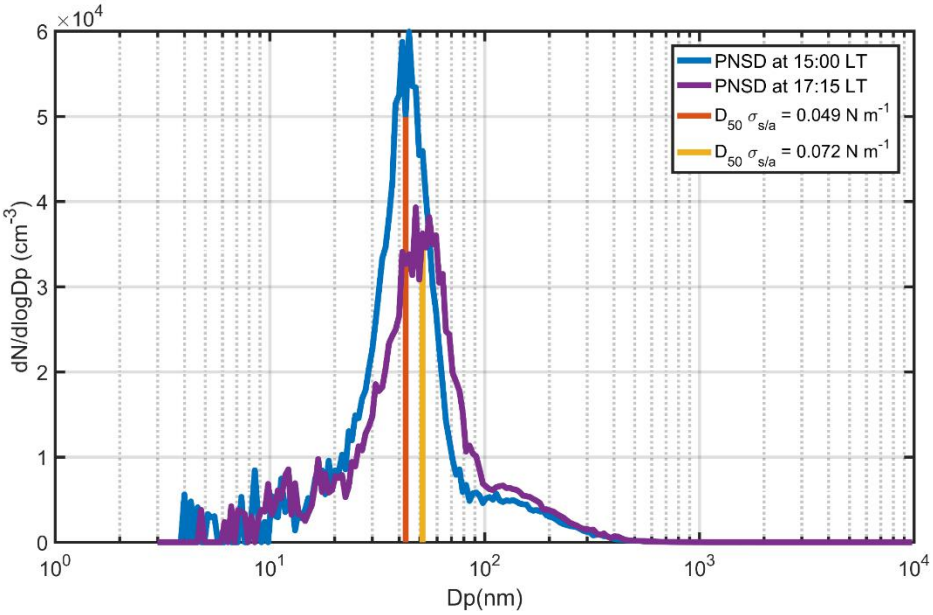

Figure S2. The PNSD and D_{50} based on surface tension of 0.049 and 0.072 N m^{-1} at 15:00 and 17:15 LT. The blue line represents the PNSD at 15:00 LT. The purple line represents the PNSD at 17:15 LT. The red line represents the measured D_{50}. The yellow line represents the recalculated D_{50} based on the surface tension of pure water.

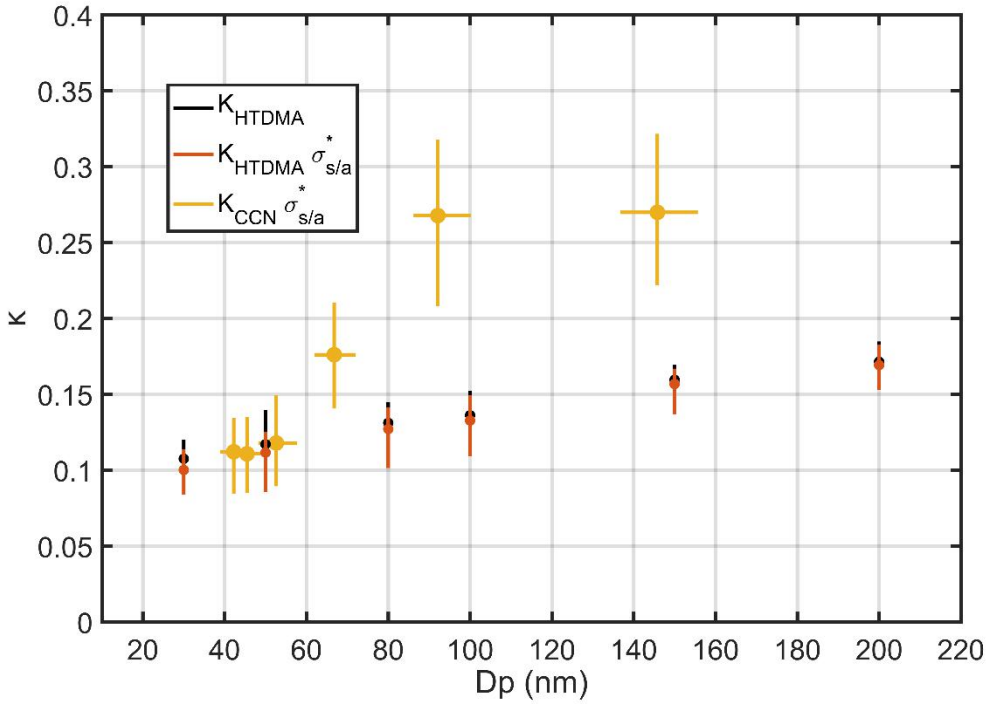

Figure S3. The median and interquartile κ_{HTDMA} and κ_{CCN}. The red and yellow line represent the κ value calculated based on $\sigma_{s/a}$* (0.060 N m^{-1})

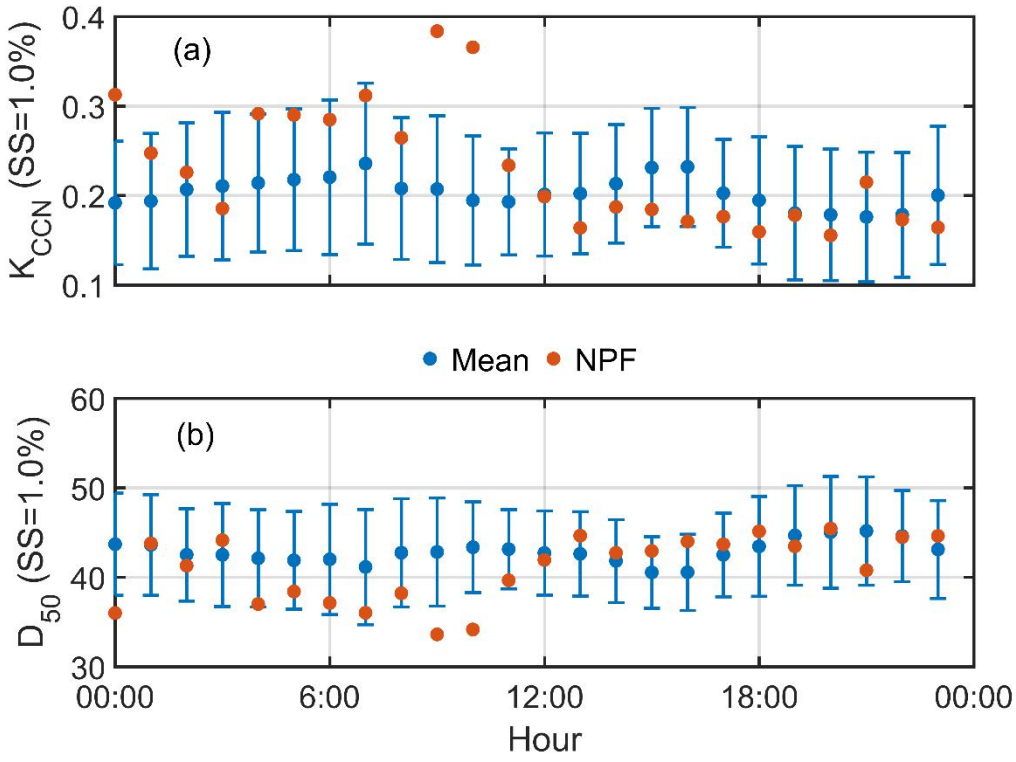

Figure S4. The diurnal variation of κ (a) and D_{50} (b) measured at 1.0% SS. The blue color represents the average diurnal variation during the campaign. The red color represents the value during the NPF events.

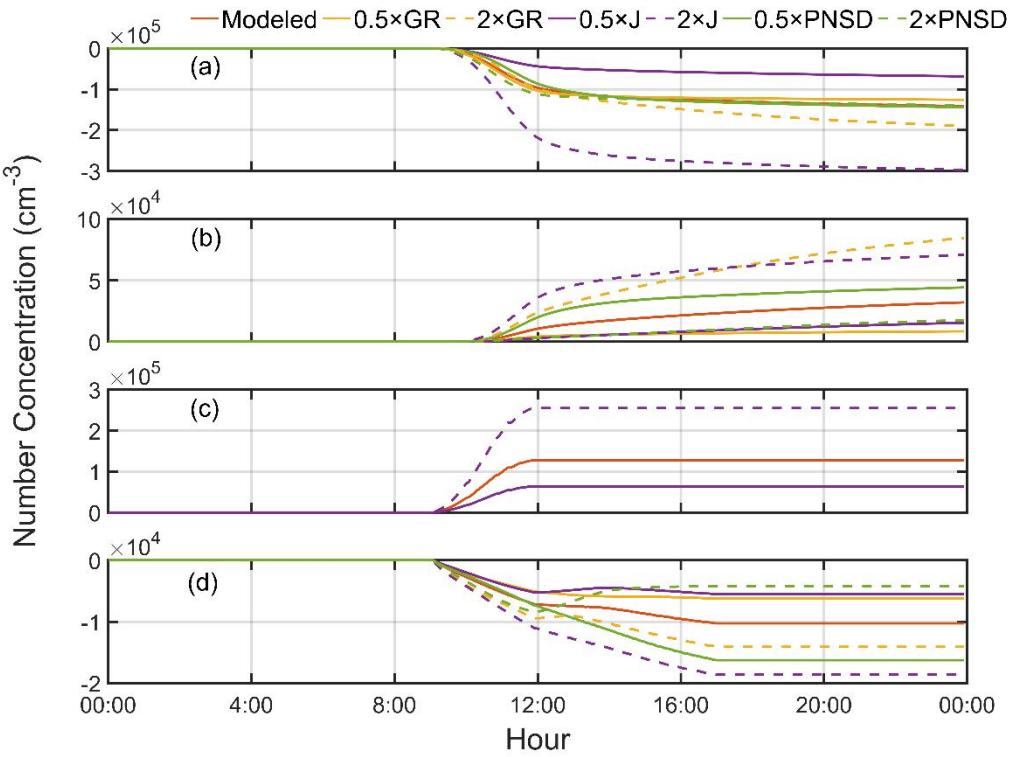

Figure S5. The contribution of coagulation sink term (a), coagulation source term (b), formation term (c), and growth term (d) to the N_{CN} in different simulations.

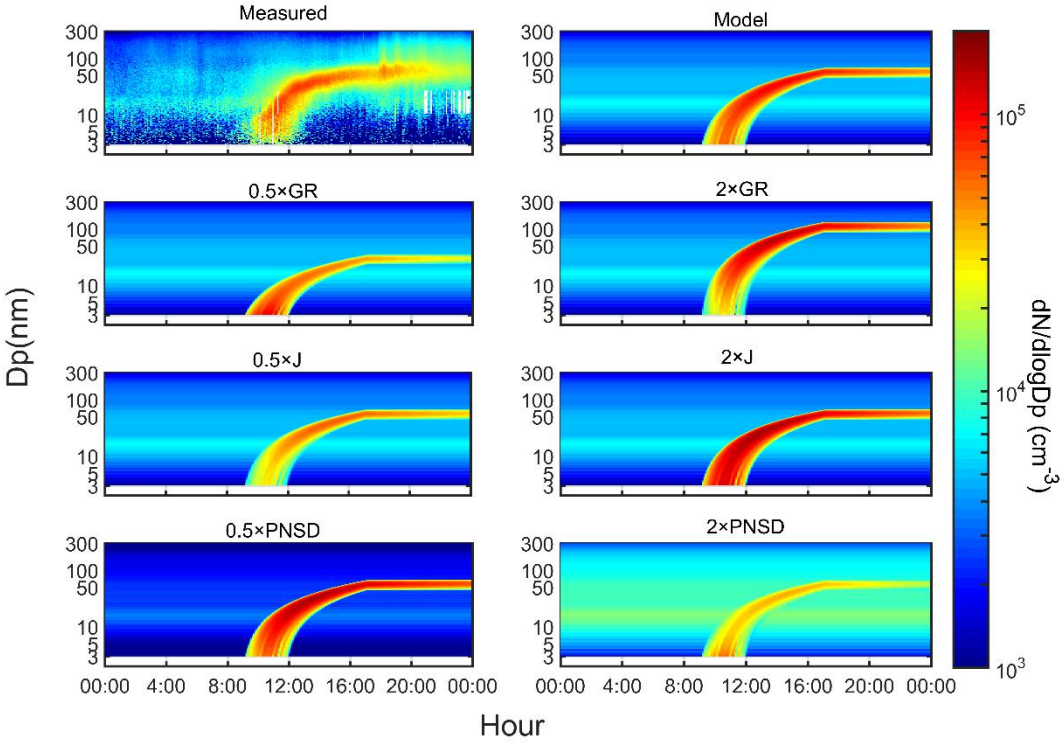

Figure S6. The PNSD obtained from measurements and simulations under different scenarios.

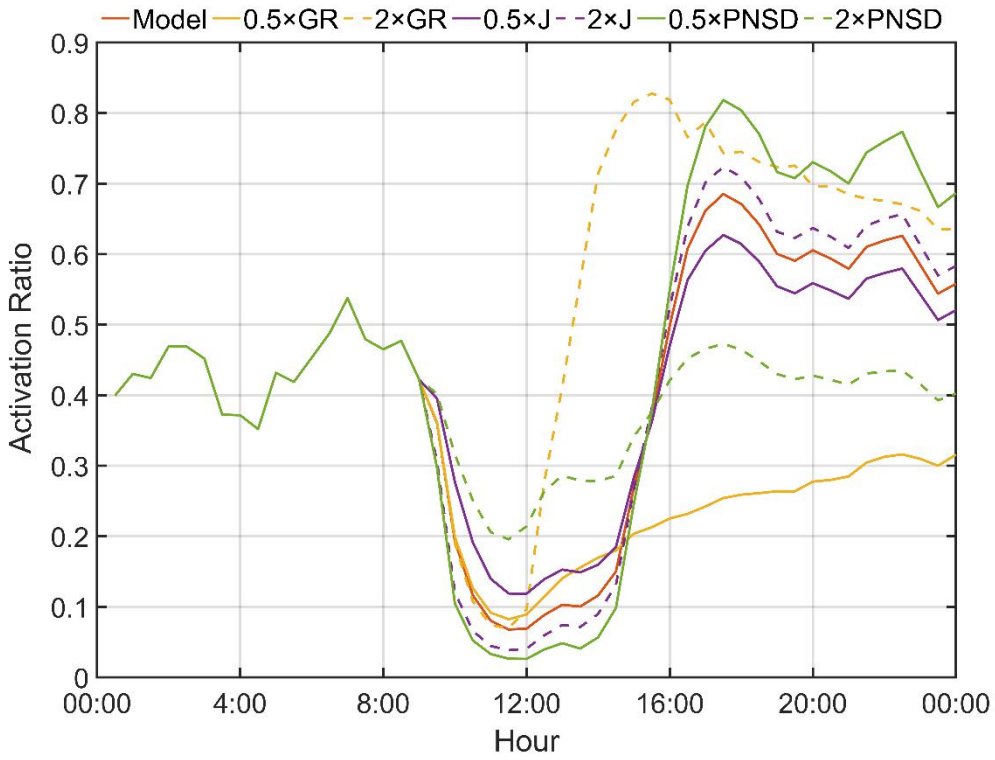

Figure S7. The activation ratio obtained from different simulations.

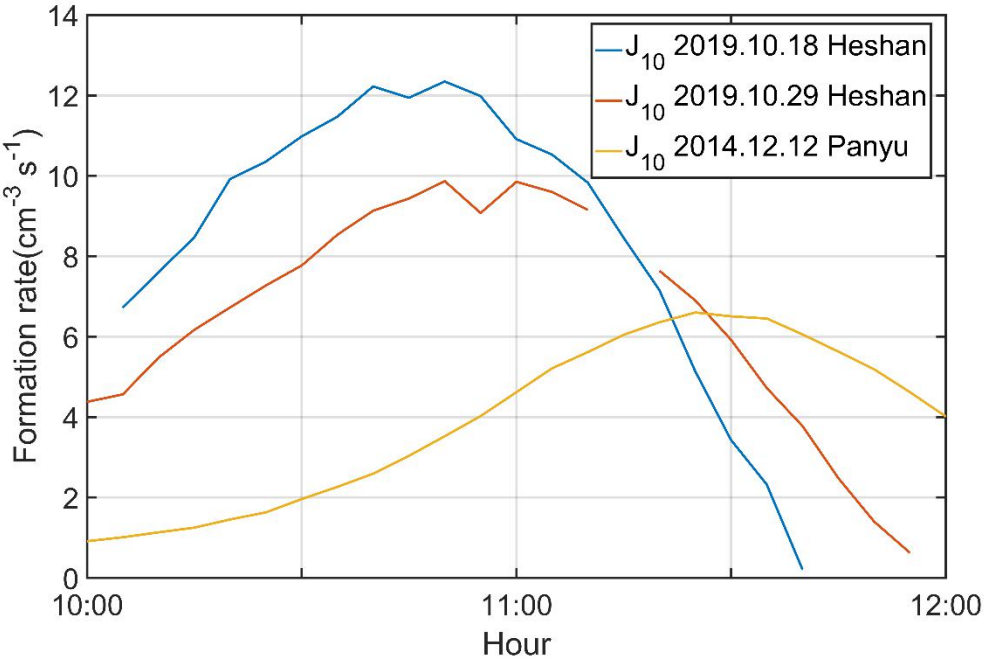

Figure S8. The measured J_{10} during different NPF events.

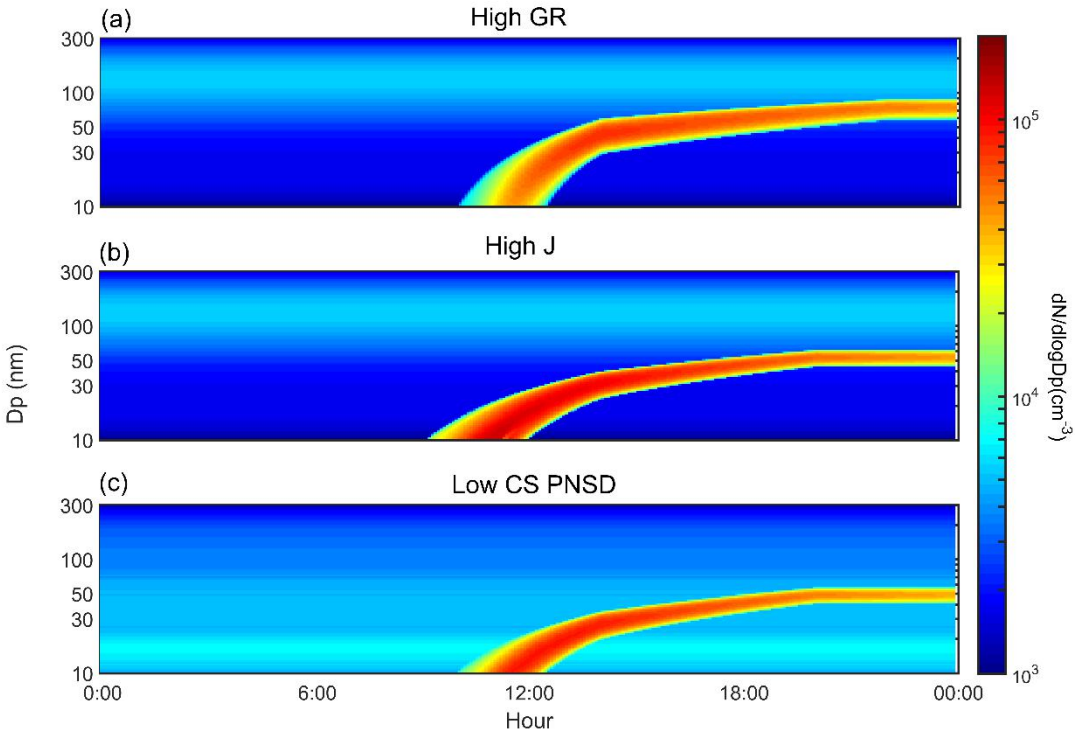

Figure S9. The simulated NPF event on 12th December, 2014 based on the high growth rate (a), the high formation rate (b), and the low CS PNSD (c).

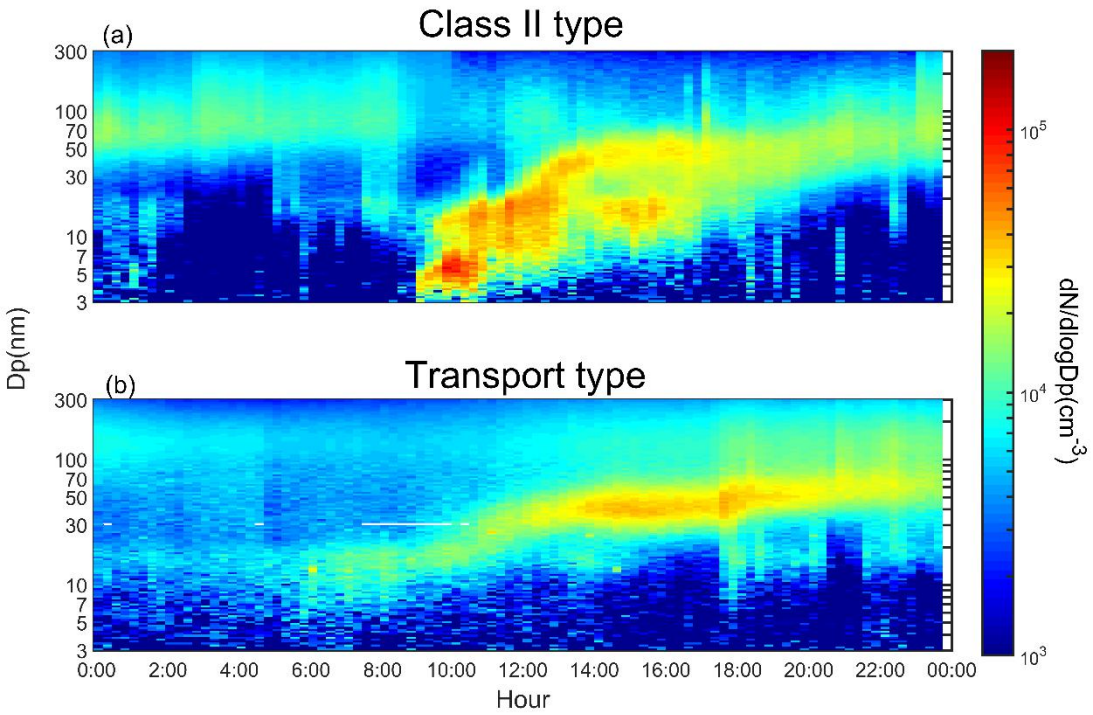

Figure S10. The "Class II" type NPF event (a) and "Transport" type NPF event (b) observed on 9th September and 14th November during the Heshan Campaign, respectively.