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Regional new particle formation as modulators of cloud condensation nuclei and cloud droplet number in the eastern Mediterranean

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SM 3.2 Impact of NPF on CCN concentrations and total aerosol number

Seasonally, 24 wintertime NPF events were recorded at Finokalia between 4:50 and 14:45 LT, with subsequent growth of the newly formed particles over the rest of the day. The analysis of the air-mass back-trajectories shows that the air originated from the North for 12 events with average speeds $7.0 \pm 0.1 \text{ m s}^{-1}$, characterized by clean air with low pollutant concentrations. Prior to initiation of the NPF, the diurnal mean value of calculated N_{total} were $2,183 \pm 134 \text{ cm}^{-3}$, and $3,902 \pm 993 \text{ cm}^{-3}$ when NPF ends, resulting in an increase of almost 79%. 9 events took place when air-masses originated from the West/Southwest sector, coming from North Africa, and afterwards spending time over the island of Crete, with moderate speeds ($5.2 \pm 1.1 \text{ m s}^{-1}$). The events were characterized by a strong increase in the diurnal mean value of N_{total} (156%), corresponding to $1,578 \pm 387 \text{ cm}^{-3}$ before, and $4,037 \pm 1,120 \text{ cm}^{-3}$ after the NPF. Only 3 events were recorded when eastern winds prevailed over the Finokalia station, with speeds above even 11 m s^{-1} (average $9.6 \pm 2.9 \text{ m s}^{-1}$), and a diurnal mean increase of N_{total} by 286%. To identify the contribution of atmospheric NPF episodes to the production of new CCN during winter, we focus on the t_{dec} (varying from 0.42 to 8.5 h, with an average value of $2.9 \pm 2.2 \text{ h}$), where the R_s display a sharp increase few hours after the t_{start} . The calculated R_s was found to range between 0.64 and 2.87 (mean value 1.17 ± 0.40) before t_{dec} , and 0.63 to 5.61 (mean value 1.71 ± 0.92) before and after the t_{dec} , respectively, and the CCN population exhibits an increase of 30, 43, 43, 44, 46, and 54%, respectively for each s . Given that smaller particles activate earlier to CCN size range particles, the t_{dec} is similar at each supersaturation level, which indicates that the size of the particles (d_c varying from 29 to 216 nm) is negligible in order to note a different t_{dec} .

In spring N_{total} was about 8% higher than in winter (average $N_{\text{total}} = 3,215 \pm 807 \text{ cm}^{-3}$), with distinct air-mass origin during the NPF episodes (Table S2). 35 events were recorded, with the t_{start} ranging between 7:40 and 13:15 LT, ending up with high wind speeds (average $7.2 \pm 0.4 \text{ m s}^{-1}$) from the North sector (315° to 45°), while 17 were detected between 7:15 and 13:00 LT, when air-masses arriving at Finokalia with an average wind speed $3.0 \pm 0.3 \text{ m s}^{-1}$ from the West/Southwest sector (270° to 200°), firstly spending time over Crete and thus being influenced by the island. The days where the events trigger the CCN production are characterized by moderate humidity (RH~60%), and spring temperature exhibited values larger than 17.5°C between 10:00 and 17:00 LT. Before the t_{start} , the diurnal average estimated value of N_{total} was $2,701 \pm 102 \text{ cm}^{-3}$, and $2,362 \pm 142 \text{ cm}^{-3}$ under northern and south/southwestern winds, respectively, while after the subsequent condensational growth of the freshly-formed particles the N_{total} was $4,103 \pm 500 \text{ cm}^{-3}$, and $3,631 \pm 580 \text{ cm}^{-3}$ for the aforementioned air-mass source regions. Therefore, it seems that higher aerosol number concentrations of new particles were observed, when air-masses came from the marine

boundary layer (northern directions), indicating that the sources of nucleating and condensing species are stronger over the marine environment than over the land (Tunved et al., 2006). The time evolution of the R_s in spring displays a diurnal variability. The contribution of new aerosols on CCN generally occurs between 10 minutes and 11 hours (average 2.6 ± 1.8 h) after the beginning of the particle formation events (t_{start}), promoting the growth of the new particles. The R_s ranges from 0.37 to 2.21 for all supersaturations during the period prior to the beginning of the production CCN (see Table S2), and they are constantly similar for each supersaturation (mean value 1.09 ± 0.28) before the t_{dec} , which suggest that at a given supersaturation level the predicted CCN values stay quite constant until the “wave” of fresh particle reaches to sufficient size to affect CCN. Via the values of the R_s we observed that NPF contributes significantly to CCN concentrations by 33, 41, 41, 43, 43, and 45%, for each supersaturation. Since the influence is almost similar for $s=0.10, 0.38, 0.52, 0.66, 0.73$, and 1.00% reveals that, smaller (average $d_c=35$ nm at $s=1.00\%$) and large (average $d_c=160$ nm at $s=0.38\%$) particles “feel” all the same the NPF, supporting that the enhancement of the CCN concentrations was not only atmospheric nucleation, but in addition the growth of sub-CCN-sized primary particles throughout their transportation.

Moving to the summer episodes, the average number concentrations of aerosol particles was calculated to be $4,254\pm372$ cm $^{-3}$, which is the highest of all seasons. 50 daytime NPF events were recorded, occurring between 6:45 and 11:05 LT. The air-mass back-trajectories in conjunction with the wind direction data indicates that out of the 50 events, the grand majority (43 events) were associated with strong northerlies over the Aegean Sea, with speeds above 8 m s $^{-1}$ (Etesian flow), while the rest 7 episodes took place when air-masses originated from the wider West/Southwest sector. Furthermore, apart from the strong winds, the summer temperatures vary between 18 and 31°C, and this season is considered as humid, with RH values reaching up to 75 % at the Finokalia station. Regarding now the Etesian flow, NPF possibly did not initiate in the vicinity of Finokalia, but probably had been taken place a few hours before air-masses arrive at the station. The freshly-formed particles were recorded at the lowest detectable sizes (~10 nm), with subsequent growth over the rest of the day, and these events are typical examples of so-called regional NPF events, in which the growth homogeneously takes place over distances of hundreds of kilometers (Kulmala et al., 2012; Kalkavouras et al., 2017). The diurnal mean value of N_{total} during summer was determined to be $3,681\pm174$ cm $^{-3}$ prior to the growth of the particles in the nucleation-mode, and $4,392\pm322$ cm $^{-3}$ after the starting of NPF, exhibiting a 20% increase, which is related to regional sources of pollutants via strong transport from the main European continent and Istanbul (Gerasopoulos et al., 2005; Kalkavouras et al., 2017). The diurnal mean value of the ratio R_s calculated throughout summer was 1.02 ± 0.24 before the starting of CCN influence, which is

the lowest seasonal value. The increase in the aerosol number concentration, N_{total} , caused by nucleation, was followed by an increase in the R_s with a time lag between 40 minutes and 9.5 hours (mean duration between t_{start} and t_{dec} was calculated to be 2.75 h), due to the gradual growth of freshly-formed particles up to 25 nm during the rest of the day. The time evolution of the R_s resembled that of N_{total} , and the contribution to the CCN concentrations were 38, 38, 39, 41, 43, and 45% (mean 41%) at each supersaturation, respectively. It can be seen that, new aerosol particles enhance the CCN concentrations to a slight extent at supersaturations above 0.52%, and therefore the similar values of the percentages likely reflect the atmospheric aging (through condensation/coagulation and cloud processing) of small (d_c varied between 28 and 40 nm), less CCN-active aerosol directly formed from NPF events.

In autumn the relative reduction of N_{total} compared to summer was 42% (mean value: $N_{\text{total}}=2,997\pm662 \text{ cm}^{-3}$), and the back-trajectory analysis of the air-masses sampled at Finokalia indicates different source regions from the other seasons. 11 NPF events were recorded between 8:25 and 12:25 LT, arriving with low wind speed (mean $4.4\pm0.2 \text{ m s}^{-1}$) from the west and south/southwest (270° to 200°), 24 NPF episodes were observed between 5:30 and 13:00 LT, when air-masses arriving at Finokalia from the north (310° to 50°) with an average wind speed $7\pm0.5 \text{ m s}^{-1}$, and a NPF event was detected when the air-mass coming from east. Prior to the t_{start} , the diurnal mean calculated value of N_{total} was $2,752\pm96 \text{ cm}^{-3}$, and $1,544\pm104 \text{ cm}^{-3}$ under northern and south/southwestern air-masses, respectively, while after the subsequent condensational growth of the new particles the N_{total} was $3,829\pm585 \text{ cm}^{-3}$, and $2,691\pm603 \text{ cm}^{-3}$ for the aforementioned air-masses origin. Thus, it appears that N_{total} has a significantly similar behavior for air-masses coming from the Balkans, and for air-masses originating from Northern Africa. Concerning finally the fraction of the R_s in autumn, the mean value for all episodes was determined as being 1.10 ± 0.23 concerning all supersaturations before the t_{dec} , while the average value of the R_s was calculated 1.73 ± 0.98 , on average 3.3 hours after the t_{start} (t_{dec} between 8:45 and 17:45 LT). Using the values of the R_s , we determined that NPF increases significantly to CCN concentrations by 29, 47, 51, 55, 58, and 77%, for each supersaturation. In autumn the largest delay in observing CCN impacts – 3.5 h after the start of the event – promote the gradually condensational growth of the new particles, which leads to a significantly increase on estimated CCN levels compared to the other seasons, mainly for higher levels of s (0.52 to 1.00%).

SM 3.3 Impact of NPF on droplet number and cloud formation

Considering as a fact that the above NPF episode considerably boosts the CCN concentrations could be misleading as to the impact on CDNCs, since the effect of NPF on CCN and therefore on N_d should not be treated separately. The actual increase caused by the impact of NPF on N_d would be the same as the impact on CCN but at a supersaturation level equal to

s_{max} , suggesting that using solely the CCN-based analysis is useless if someone really wants to quantify the influence of NPF on N_d . Throughout the NPF, the s_{max} which formed in a cloud actually slowly increases after the initiation of NPF and decreases gradually when the “wave” of new particles influences the N_d . Moreover, the N_d does not increase but only until late in the afternoon, owing to the enhanced competition for water vapor by the ever increasing CCN. The mean value of the s_{max} was determined as being $0.11\pm0.03\%$, and $0.15\pm0.05\%$ for updraft velocities of 0.3 m s^{-1} , and 0.6 m s^{-1} , respectively which could be proposed as indicative values when someone uses parameterizations to calculate the N_d . Nevertheless, by selecting a pre-determined supersaturation or a critical diameter to calculate CCN concentrations and N_d , can lead to an ambiguous conclusion regarding the influence of NPF on ambient clouds, and would be preferable to avoid the CCN-based approach and instead refer to the new paradigm of analysis that uses only parameterizations and N_d .

During winter, all NPF events ($n=24$) over Finokalia trigger the production of CCN and therefore the formation of N_d between 8:05 and 17:40 LT, on average 2.6 hours after the t_{dec} (t_{Nd} was recorded from 30 min to 6 hours, after the t_{dec}). For both σ_w a slight decrease regarding the s_{max} was calculated compared to the period between t_{start} and t_{dec} , while the respective perturbation regarding the N_d from the NPF episodes exhibits on average a limited increase (see Table S3). The supersaturations developed in NPF-influenced clouds (0.13% for 0.3 m s^{-1} and 0.18% for 0.6 m s^{-1}) in winter, moves the size of particles affected by cloud processing to larger particles, since the critical diameters during the NPF events varied from 86 to 190 nm (mean d_c 150 nm for supersaturation 0.10% , and 95 nm for 0.20%). Moreover, the percentage change of the variance in N_d for both updraft velocities σ_w , exhibits the highest seasonal variance regarding the N_d , which is in conjunction with the lowest variability in N_{total} . From the relative contribution of the total aerosol number and chemical composition to N_d , it can be seen that the larger contribution is owed to the variance of the total aerosol number to the potential CDNC, while the influence of the chemical composition being limited for both cloud updraft velocities (Table S5).

Throughout spring, aerosol levels were much higher compared to winter and N_d exhibited also an increasing trend after the NPF episodes. All events ($n=52$) occurred during daytime, and the enhancement of the N_d observed from 9:25 to 21:45 LT, on average 3 hours after the t_{dec} (t_{Nd} was varied between 40 min and 8.5 hours, after the t_{dec}). Overall, the contribution of the NPF episodes concerning the cloud droplet number concentrations increased as expected for $\sigma_w=0.3$ and 0.6 m s^{-1} , respectively compared to pre- t_{Nd} values (Table S3). This augmentation is related with the decrease in s_{max} , for the aforementioned cloud updraft velocities, which indicates that the increase of competition of CCN for water vapor with d_c varying from 29 to 200 nm, can reduce cloud supersaturation. The variance in the N_d caused by the NPF

corresponds to a variability in N_{total} of more than 1,600 particles (cm^{-3}). On average, in spring almost the same values are calculated as during winter regarding the percentage contribution of the total aerosol number and hygroscopicity to the daily droplet number variance calculated for both σ_w (Table S5). This further supports the above finding that the droplet number variability mostly reflects the intensity of the total aerosol number over Finokalia during NPF events.

The relative contribution of NPF into CDNC during summer was observed on average 3.1 hours after the initiation of potential CCN production. Particularly, t_{Nd} occurred mainly after 12:00 LT (47 days), apart from 3 days when t_{Nd} was specified between 10:45 to 11:50 LT. Concerning now the s_{max} , it decreases for both cloud updraft velocities, compared to the period between t_{start} and t_{dec} , once again, and it should be mentioned that, the doubling in the σ_w causes s_{max} to increase by 43%. The decrease caused by the NPF was on average all the same, when σ_w is equal to 0.3 and 0.6 m s^{-1} , which indicates that the fluctuation of s_{max} is independent from the larger cloud updraft velocity, allowing the newly formed particles, which in the meanwhile grow to larger particles (155 nm; accumulation-mode) to activate into cloud droplets. As expected, the reduction of s_{max} goes with a respective increase of N_d during the NPF days. For all events in summer, the NPF is followed by a limited augmentation regarding the N_d (Table S3), regardless of the highest seasonal aerosol concentrations (mean $4,254 \pm 372 \text{ cm}^{-3}$), and by extension the highest estimated CCN concentrations for each supersaturation observed during this season, confirming once again that larger and more aged aerosol particles are mostly affected and may activate into cloud droplets. The variance of CDNC due to NPF was determined to be merely 36 and 101 cm^{-3} for each σ_w , whereas the highest contribution to the variance of N_d is attributed once more to aerosol number and to a limited extent to the chemical composition. By doubling the cloud updraft velocity, the chemical composition during summer exhibits the highest contribution to CDNC compared to the other seasons, indicating the enhancement of vertical mixing which preceded the arrival of the air plume at Finokalia.

In autumn the NPF events ($n=36$) influenced the CDNC between 10:15 and 21:10 LT, on average 2.8 hours after the t_{dec} . When σ_w is equal to 0.3 m s^{-1} the NPF episodes are associated with s_{max} decreases compared to the period between t_{start} and t_{dec} (Table S3), and in consequence, CDNC throughout the NPF events increased, compared to the pre- t_{Nd} values. The larger σ_w lead to higher values of s_{max} showing an increase of 50%, which allow smaller particles to activate into droplets. N_d displays a substantial augmentation for $\sigma_w = 0.6 \text{ m s}^{-1}$ (on average 52%), indicating the impact of mean vertical velocity on the CDNC. The mean N_d concentrations prior and after the t_{Nd} , exhibited relative increase of 15%. The respective

variance of N_d when the NPF influence CDNC was 91 and 205 cm^{-3} for both σ_w , respectively while the predicted N_d variability is almost entirely controlled by the aerosol number fluctuation, and to a limited extent by the chemical composition for both cloud updraft velocities.

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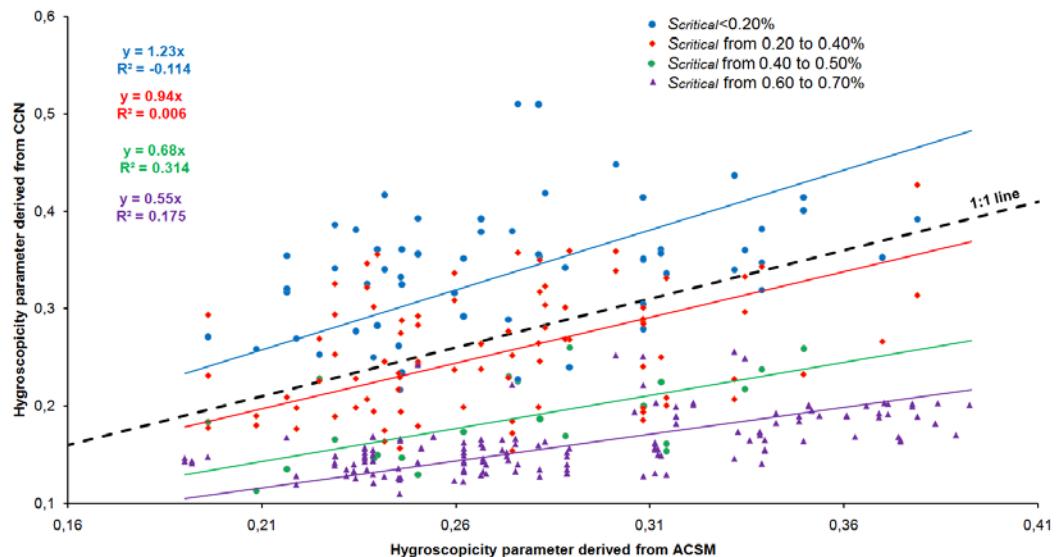
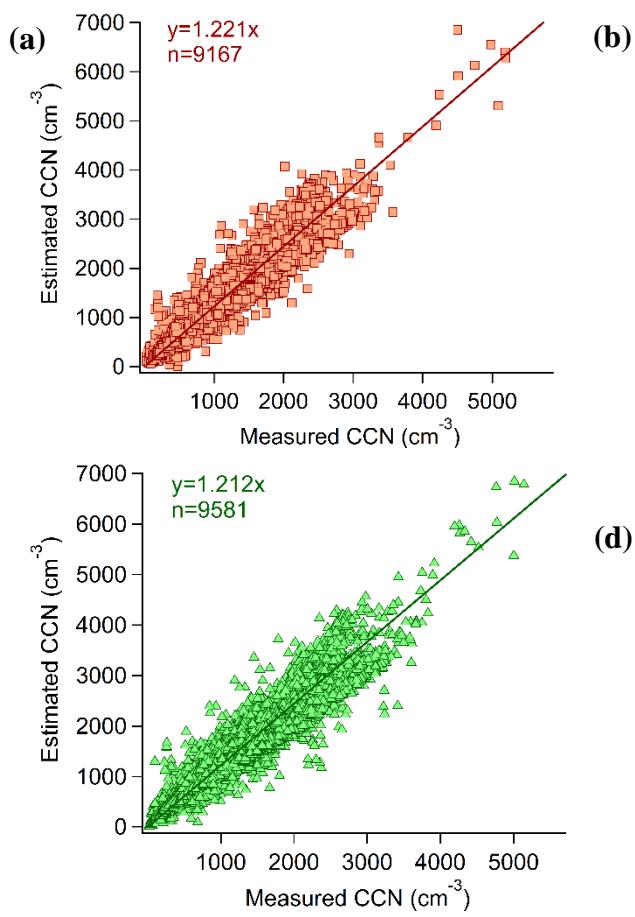


Figure S1. Predicted against measured hygroscopicity parameter (κ) at critical supersaturation under 0.20% (blue dot), from 0.20 to 0.40% (red rhombus), from 0.40 to 0.50% (green dot), and from 0.60 to 0.70% (purple triangle), respectively on 29, 30 August and 9, 22 September 2012.



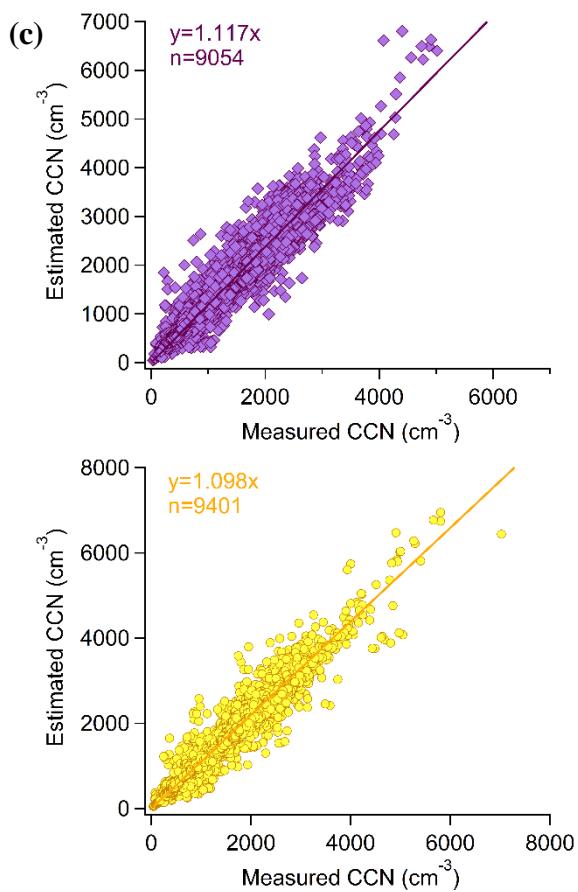
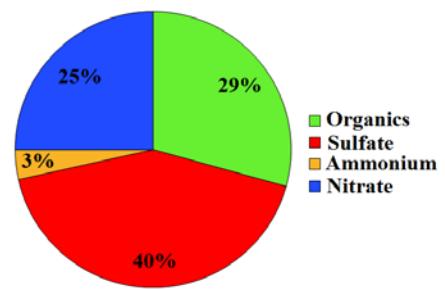
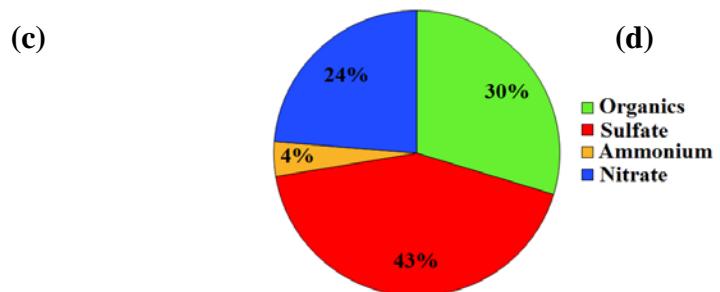
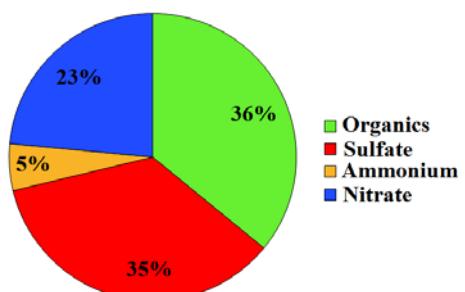
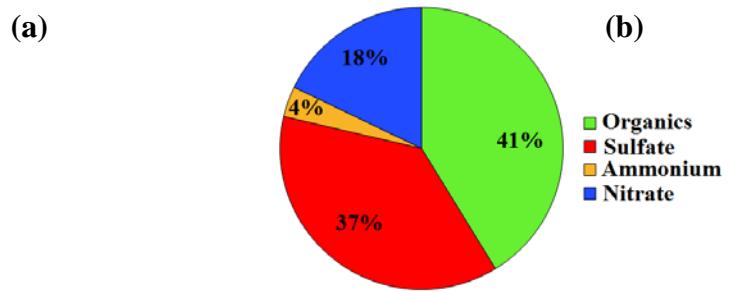


Figure S2. Measured against estimated CCN concentrations at each supersaturation s (a) 0.38%, (b) 0.52%, (c) 0.66%, and (d) 0.73%.



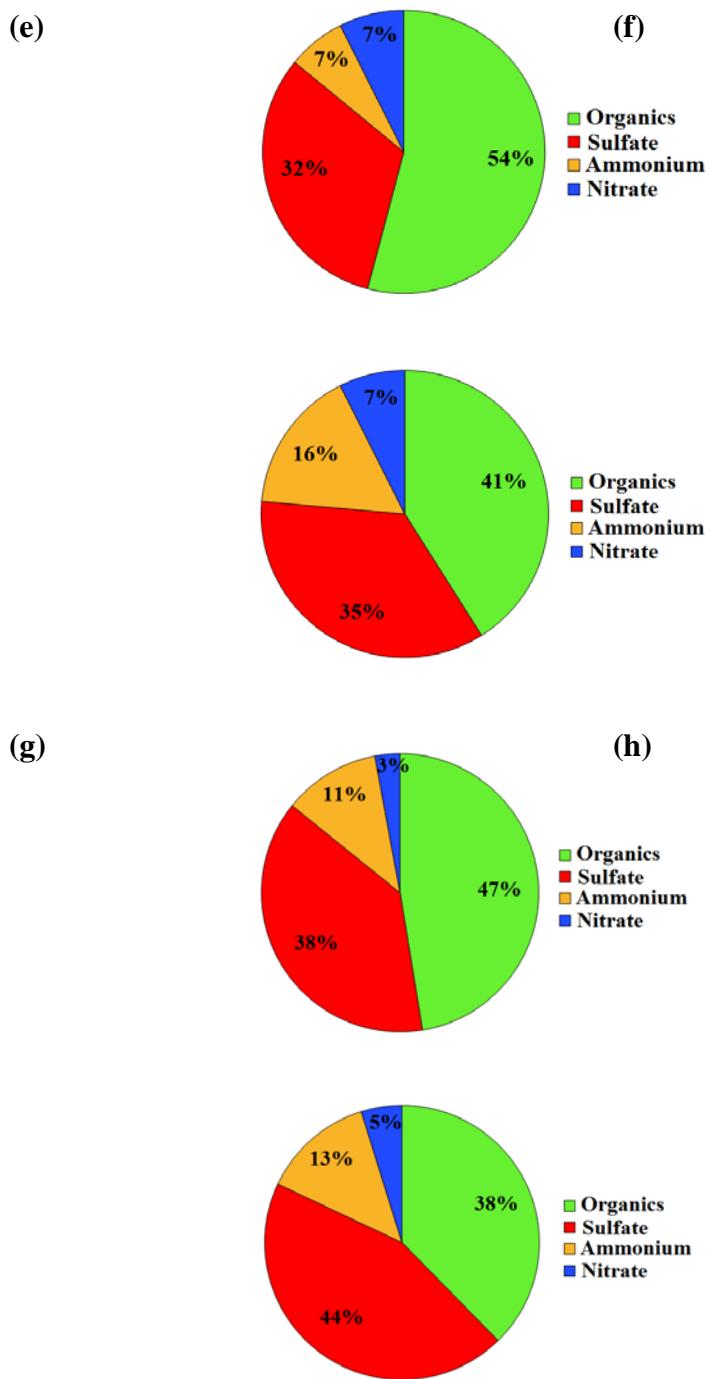


Figure S3. Seasonal evolution of the chemical composition (organics, sulfate, ammonium, and nitrate) of the total estimated PM₁ mass throughout (a) winter, (b) spring, (c) summer, and (d) autumn from June 2008 to December 2011 as derived from the bulk PM₁₀ 24-h quartz fiber filters, and of the non-refractory submicron aerosol particles during (e) winter, (f) spring, (g) summer, and (h) autumn from May 2012 to May 2015 as derived from the ACSM measurements.

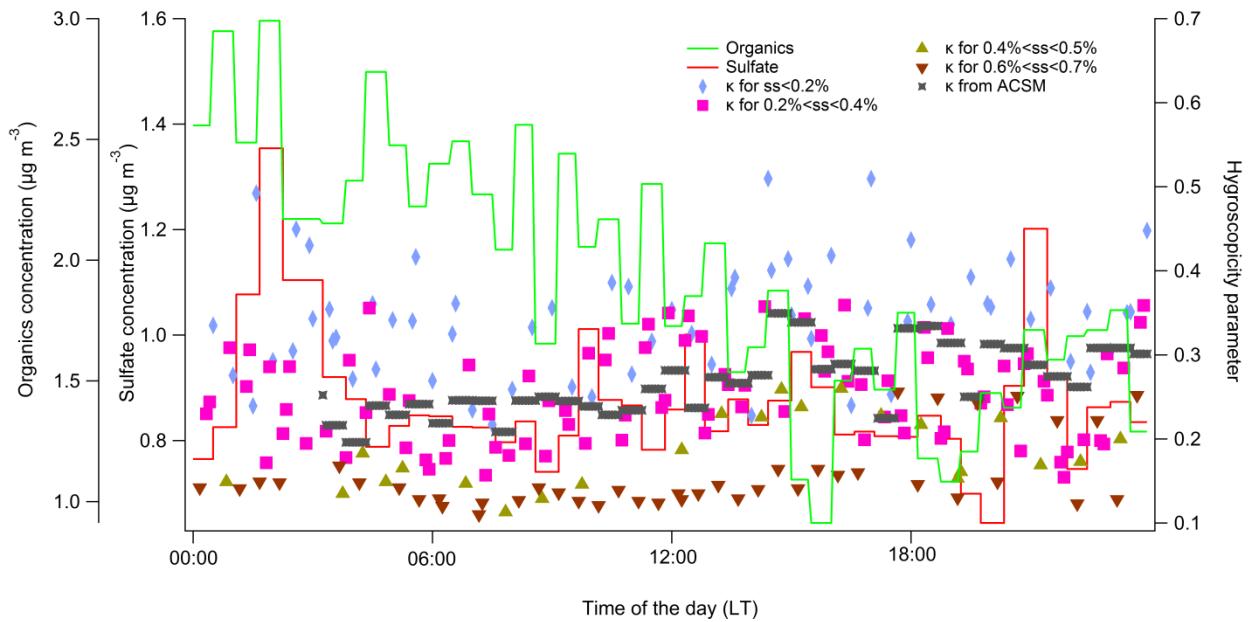


Figure S4. Diurnal evolution of organic and sulfate loadings together with the hygroscopicity parameter (κ) derived from ACSM data (grey cross) and the κ obtained from the CCN counter for critical supersaturation under 0.20% (blue rhombus), from 0.20 to 0.40% (magenta square), from 0.40 to 0.50% (green triangle), and from 0.60 to 0.73% (brown triangle), respectively on 29 August 2012.

Table S1. Regression statistics for the CCN closure.

Supersaturation, s (%) (n=data points)	$\frac{\text{CCN}_{\text{estimated}}}{\text{CCN}_{\text{measured}}}$	R^2
0.38 (n=9167)	1.221	0.885
0.52 (n=9581)	1.212	0.892
0.66 (n=9054)	1.117	0.911
0.73 (n=9401)	1.098	0.933

Table S2. Seasonal wind direction, starting time of a NPF event (t_{start}), decoupling time (t_{dec}), R_s before (bef) being the time step between t_{start} and t_{dec} , and after (aft) being the time step between t_{dec} and the end of CCN production, and the increase of the R_s (%) observed after the t_{dec} for supersaturations 0.10, 0.38, 0.52, 0.66, 0.73, and 1.00%, respectively. Time is in LT.

Date	Dir (°)	t_{start} (LT)	t_{det} (LT)	$R_{0.10}$ (bef)	$R_{0.10}$ (aft)	Increase of the $R_{0.10}$ (%)	$R_{0.38}$ (bef)	$R_{0.38}$ (aft)	Increase of the $R_{0.38}$ (%)	$R_{0.52}$ (bef)	$R_{0.52}$ (aft)	Increase of the $R_{0.52}$ (%)	$R_{0.66}$ (bef)	$R_{0.66}$ (aft)	Increase of the $R_{0.66}$ (%)	$R_{0.73}$ (bef)	$R_{0.73}$ (aft)	Increase of the $R_{0.73}$ (%)	$R_{1.00}$ (bef)	$R_{1.00}$ (aft)	Increase of the $R_{1.00}$ (%)	
Winter																						
1	4/12/2008	S/SW	11:10	12:05	1.17	1.33	14	1.12	1.28	14	1.09	1.23	13	1.09	1.22	12	1.08	1.22	13	1.07	1.26	18
2	13/12/2008	W	10:25	12:55	0.99	1.42	43	1.05	2.22	111	1.08	2.28	111	1.10	2.21	101	1.10	2.17	97	1.10	2.07	88
3	26/12/2009	S/SW	12:20	14:55	2.87	4.93	72	2.62	5.38	105	2.49	5.27	112	2.42	5.24	117	2.39	5.26	120	2.29	5.61	145
4	19/2/2010	W	7:45	16:15	1.17	1.43	22	1.40	2.31	65	1.42	2.20	55	1.38	2.04	48	1.32	1.91	45	1.32	2.00	52
5	26/2/2010	NW	11:30	14:10	1.18	1.34	14	1.52	2.09	38	1.58	2.15	36	1.58	2.12	34	1.58	2.11	34	1.55	2.03	31
6	3/1/2011	S/SW	14:05	15:55	1.19	1.52	28	1.41	1.92	36	1.40	1.90	36	1.40	1.79	28	1.40	1.84	31	1.41	1.76	25
7	6/1/2011	N	14:45	15:35	0.97	1.05	8	1.04	1.10	6	1.07	1.17	9	1.06	1.14	8	1.06	1.13	7	1.07	1.11	4
8	17/1/2011	NE	11:10	14:20	0.95	0.83	-13	0.95	0.96	1	0.97	1.17	21	0.98	1.44	47	1.00	1.82	82	1.03	2.57	150
9	19/1/2011	N	12:45	17:40	0.64	1.40	119	0.84	1.81	115	0.85	1.73	104	0.86	1.66	93	0.87	1.59	83	0.89	1.59	79

10	1/2/2011	N	11:00	17:00	0.83	0.63
11	7/2/2011	E	13:50	14:40	1.29	2.19
12	10/2/2011	N	11:30	16:30	0.66	0.70
13	11/2/2011	N	10:05	17:15	0.70	1.00
14	1/1/2012	NE	5:45	-	-	-
15	26/1/2012	W	4:50	-	-	-
16	21/1/2013	E	11:00	11:50	1.07	1.31
17	23/1/2013	W	10:45	12:10	0.91	0.97
18	8/1/2014	NE	13:10	14:30	1.18	1.31
19	10/1/2014	NW	11:30	12:50	0.81	0.89
20	23/1/2014	W	10:05	11:25	1.09	1.43
21	30/1/2014	E	11:05	12:15	0.89	0.94
22	22/12/2014	N	9:20	12:30	0.95	0.91
23	11/1/2015	NW	11:25	11:50	0.90	0.99
24	23/1/2015	S/SW	9:20	10:50	0.78	1.11

Spring

25	14/3/2009	NW	10:15	12:30	1.04	1.25									
26	19/3/2009	N	8:50	14:05	1.01	1.09									
27	30/3/2009	NW	10:35	14:40	0.95	1.27									
28	22/5/2009	NE	9:00	10:45	0.99	1.08									
29	28/5/2009	NE	8:00	8:35	1.07	1.46									
30	13/3/2010	W	10:20	11:50	1.02	1.05									
31	16/3/2010	N	10:00	12:55	0.89	0.88									
32	18/3/2010	N	11:15	14:00	0.95	0.97									
33	19/3/2010	N	13:15	16:05	1.12	1.19									
34	22/3/2010	W	10:50	12:15	1.02	1.06									
35	27/3/2010	N	10:05	12:55	0.81	1.10									
36	30/3/2010	NW	11:20	11:30	1.00	1.10									
37	7/4/2010	NW	9:00	12:15	1.54	1.61									
38	8/4/2010	N	11:30	13:30	0.93	1.30									
39	9/4/2010	NE	10:25	12:05	1.16	1.21									
40	15/4/2010	S/SW	13:00	14:25	0.90	0.89									
41	17/4/2010	S/SW	9:50	13:35	1.53	2.32									
42	29/4/2010	NE	10:15	13:50	0.81	1.17									
43	1/5/2010	NE	9:25	10:40	1.00	1.18									
-24	0.96	1.04	8	0.98	1.43	46	0.98	1.98	102	0.98	2.19	123	1.04	3.04	192
70	1.45	2.58	78	1.41	2.52	79	1.38	2.59	88	1.38	2.64	91	1.45	2.95	103
6	0.79	0.80	1	0.84	0.87	4	0.86	0.96	12	0.87	1.01	16	0.87	1.16	33
43	0.68	1.19	75	0.66	1.13	71	0.65	1.04	60	0.64	0.99	55	0.64	1.11	73
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	1.04	1.34	29	1.01	1.29	28	1.01	1.26	25	1.00	1.24	24	1.00	1.24	24
7	1.13	1.42	26	1.12	1.36	21	1.12	1.33	19	1.10	1.32	20	1.11	1.28	15
11	1.75	1.94	11	1.77	1.91	8	1.78	1.90	7	1.80	1.89	5	1.83	1.92	5
10	1.14	1.41	24	1.11	1.33	20	1.11	1.30	17	1.10	1.29	17	1.10	1.33	21
31	1.08	1.66	54	1.03	1.5	46	0.99	1.37	38	0.97	1.37	41	0.94	1.36	45
6	1.12	1.33	19	1.09	1.27	17	1.09	1.24	14	1.08	1.21	12	1.07	1.19	11
-4	1.11	1.71	54	1.11	1.66	50	1.19	1.65	39	1.07	1.45	36	1.10	1.42	29
10	1.37	2.03	48	1.49	2.02	36	1.63	2.14	31	1.69	2.14	27	1.77	2.08	18
42	0.77	1.02	32	0.77	1.00	30	0.78	1.01	29	0.78	1.01	29	0.79	1.02	29
20	0.93	2.20	137	0.93	3.32	257	0.93	3.69	297	0.93	4.01	331	0.95	3.84	304
8	1.10	1.72	56	1.16	2.35	103	1.21	3.19	164	1.23	3.50	185	1.27	4.36	243
34	0.90	1.02	13	0.90	1.01	12	0.89	0.99	11	0.89	0.98	10	0.88	0.97	10
9	1.01	1.08	7	0.98	1.01	3	0.92	0.98	7	0.90	0.95	6	0.86	0.92	7
36	1.14	1.46	28	1.12	1.36	21	1.09	1.30	19	1.08	1.30	20	1.05	1.35	29
3	1.09	1.16	6	1.08	1.12	4	1.07	1.10	3	1.07	1.09	2	1.05	1.04	-1
-1	0.98	1.03	5	0.99	1.06	7	0.99	1.04	5	0.99	1.03	4	0.99	1.00	1
2	1.03	1.11	8	1.03	1.09	6	1.01	1.04	3	1.00	1.02	2	0.99	1.00	1
6	1.20	1.23	3	1.20	1.27	6	1.20	1.28	7	1.20	1.28	7	1.18	1.25	6
4	0.99	1.00	1	0.98	0.98	0	0.98	0.97	-1	0.98	0.97	-1	0.98	0.96	-2
36	1.03	1.40	36	1.08	1.47	36	1.09	1.40	28	1.11	1.39	25	1.11	1.41	27
10	1.04	1.17	13	1.08	1.21	12	1.03	1.07	4	1.03	1.04	1	1.05	1.03	-2
5	1.81	1.76	-3	1.75	2.04	17	1.73	2.35	36	1.71	2.46	44	1.66	2.95	78
40	1.00	1.37	37	0.99	1.29	30	0.98	1.23	26	0.97	1.22	26	0.97	1.19	23
4	1.24	1.52	23	1.24	1.49	20	1.23	1.46	19	1.29	1.48	15	1.28	1.49	16
-1	0.89	1.05	18	0.89	1.06	19	0.89	1.10	24	0.90	1.20	33	0.90	1.52	69
52	2.12	3.44	62	2.21	3.47	57	2.16	3.32	54	2.14	3.24	51	2.13	3.26	53
44	0.88	1.23	40	0.89	1.21	36	0.89	1.17	31	0.89	1.16	30	0.88	1.14	30
18	1.00	1.02	2	1.00	1.00	0	0.98	0.99	1	0.97	0.98	1	0.93	0.95	2

44	30/5/2010	N	7:55	9:40	0.87	0.83	-5	0.87	0.97	11	0.88	1.04	18	0.89	1.09	22	0.89	1.09	22	0.89	1.12	26
45	9/3/2011	NE	10:35	11:50	1.01	1.26	25	1.10	1.41	28	1.11	1.50	35	1.11	1.48	33	1.11	1.47	32	1.08	1.43	32
46	19/3/2011	W	10:25	12:05	0.78	1.00	28	0.91	1.04	14	0.90	1.01	12	0.89	0.97	9	0.89	0.97	9	0.87	0.96	10
47	29/3/2011	S/SW	11:55	13:00	1.03	1.25	21	1.04	1.34	29	1.05	1.37	30	1.06	1.40	32	1.07	1.43	34	1.07	1.48	38
48	12/4/2011	N	11:00	13:45	1.07	1.60	50	1.05	1.69	61	1.05	1.58	50	1.05	1.54	47	1.06	1.50	42	1.05	1.44	37
49	3/5/2011	S/SW	9:40	12:30	0.92	1.06	15	1.08	1.36	26	1.07	1.33	24	1.07	1.27	19	1.09	1.27	17	1.08	1.21	12
50	4/5/2011	W	10:30	13:50	1.42	3.87	173	2.12	4.01	89	2.18	3.86	77	2.17	3.55	64	2.15	3.43	60	2.11	2.99	42
51	14/5/2011	NE	9:25	10:50	0.96	1.00	4	1.03	1.08	5	1.00	1.03	3	0.94	1.02	9	0.92	1.00	9	0.88	0.96	9
52	25/4/2012	S/SW	12:55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
53	1/5/2012	NE	9:10	12:05	1.12	1.21	8	1.18	1.34	14	1.17	1.31	12	1.17	1.25	7	1.19	1.26	6	1.18	1.23	4
54	14/5/2012	N	8:45	10:55	1.03	1.10	7	1.11	1.21	9	1.08	1.14	6	1.02	1.21	19	1.00	1.16	16	1.06	1.12	6
55	6/3/2013	N	10:45	12:00	1.02	1.09	7	1.13	1.44	27	1.14	1.52	33	1.14	1.51	32	1.14	1.50	32	1.11	1.46	32
56	10/3/2013	W	9:35	11:45	1.26	3.25	158	1.18	3.59	204	1.21	3.30	173	1.20	3.07	156	1.19	2.71	128	1.17	2.40	105
57	13/3/2013	W	9:45	13:15	1.20	2.36	97	1.48	3.49	136	1.53	3.20	109	1.43	2.79	95	1.49	2.74	84	1.46	2.50	71
58	23/3/2013	NW	8:40	14:50	0.59	0.67	14	0.54	0.77	43	0.54	0.77	43	0.56	0.78	39	0.57	0.85	49	0.59	1.05	78
59	24/3/2013	NW	7:40	9:30	0.95	2.07	118	1.05	1.84	75	1.10	1.85	68	1.07	1.71	60	1.08	1.71	58	1.13	1.71	51
60	27/3/2013	W	9:10	13:50	1.26	1.51	20	1.35	1.80	33	1.37	1.78	30	1.36	1.71	26	1.36	1.68	24	1.37	1.67	22
61	5/4/2013	S/SW	10:40	12:20	1.62	1.95	20	1.47	2.04	39	1.46	1.92	32	1.48	1.99	34	1.44	1.91	33	1.43	1.96	37
62	19/4/2013	NE	11:00	13:10	1.07	1.72	61	1.41	2.19	55	1.39	2.05	47	1.45	1.97	36	1.38	1.88	36	1.36	1.85	36
63	21/4/2013	NE	12:10	15:00	1.04	1.40	35	1.12	1.54	38	1.12	1.50	34	1.06	1.45	37	1.06	1.45	37	1.06	1.51	42
64	1/5/2013	NE	10:35	11:45	0.98	1.06	8	1.00	1.08	8	1.01	1.05	4	1.00	1.01	1	1.00	1.01	1	0.99	1.00	1
65	22/5/2013	NW	12:15	15:30	0.90	1.12	24	0.92	1.14	24	0.94	1.11	18	0.99	1.11	12	1.02	1.11	9	1.08	1.15	6
66	13/3/2014	NE	12:35	20:05	1.08	1.35	25	1.01	1.17	16	0.99	1.19	20	0.99	1.30	31	0.99	1.36	37	1.00	1.52	52
67	21/3/2014	N	10:00	21:05	0.92	1.09	18	0.76	1.96	158	0.75	2.12	183	0.75	2.20	193	0.75	2.21	195	0.75	2.21	195
68	23/3/2014	W	8:15	10:15	1.05	1.31	25	1.19	1.37	15	1.19	1.31	10	1.19	1.27	7	1.19	1.26	6	1.22	1.26	3
69	30/3/2014	N	12:40	13:05	0.37	0.80	116	0.38	0.81	113	0.41	0.82	100	0.46	0.83	80	0.47	0.84	79	0.53	0.85	60
70	2/5/2014	S/SW	10:40	13:35	1.01	1.19	18	1.12	1.40	25	1.10	1.36	24	1.10	1.30	18	1.11	1.29	16	1.11	1.24	12
71	21/5/2014	N	8:45	10:15	0.99	1.03	4	1.05	1.13	8	1.06	1.14	8	1.07	1.10	3	1.06	1.08	2	1.05	1.09	4
72	23/5/2014	NE	8:05	12:30	0.82	0.97	18	0.94	1.05	12	0.92	1.05	14	0.91	1.05	15	0.92	1.05	14	1.05	1.06	1
73	25/5/2014	NW	9:40	11:25	0.84	0.95	13	0.98	1.14	16	0.97	1.13	16	0.95	1.14	20	0.95	1.15	21	0.95	1.13	19
74	26/5/2014	S/SW	9:15	11:40	1.02	1.19	17	0.97	1.20	24	0.96	1.20	25	1.02	1.21	19	1.02	1.19	17	1.17	1.23	5
75	30/4/2015	W	7:15	9:35	0.97	1.69	74	1.12	3.00	168	1.08	3.06	183	1.07	3.11	191	1.08	3.16	193	1.12	3.27	192
76	2/5/2015	NW	8:55	10:15	0.99	1.15	16	1.04	1.29	24	1.07	1.31	22	1.06	1.32	25	1.06	1.36	28	1.07	1.50	40

Summer

77	9/6/2008	W	9:45	14:45	1.50	3.56	137	1.72	2.42	41	1.69	2.24	33	1.68	2.12	26	1.68	2.09	24	1.70	2.02	19
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78	15/6/2008	NW	7:40	9:50	0.92	0.98	7	0.97	1.28	32	0.96	1.28	33	0.96	1.24	29	0.96	1.23	28	1.00	1.19	19
79	16/6/2008	N	8:40	10:20	1.08	2.63	144	1.15	1.85	61	1.10	1.68	53	1.09	1.63	50	1.09	1.61	48	1.10	1.58	44
80	20/6/2008	NW	7:25	12:05	1.98	6.05	206	2.04	3.76	84	2.01	3.57	78	1.98	3.44	74	1.98	3.43	73	1.96	3.37	72
81	24/7/2008	NW	8:45	9:30	1.01	0.65	-36	1.00	1.31	31	0.98	1.24	27	0.97	1.23	27	0.97	1.24	28	0.96	1.24	29
82	25/7/2008	NW	7:50	11:00	0.97	1.14	18	1.07	1.53	43	1.07	1.39	30	1.07	1.29	21	1.07	1.26	18	1.05	1.17	11
83	26/7/2008	NW	6:50	9:50	1.05	1.86	77	1.02	1.85	81	1.02	1.78	75	1.02	1.76	73	1.02	1.76	73	1.05	1.77	69
84	30/7/2008	N	9:55	12:40	1.08	1.21	12	1.19	1.52	28	1.20	1.67	39	1.20	1.80	50	1.20	1.89	58	1.19	1.95	64
85	15/6/2009	NE	10:35	14:10	0.95	1.48	56	0.92	1.55	68	0.90	1.46	62	0.89	1.39	56	0.88	1.38	57	0.87	1.38	59
86	19/6/2009	NE	11:05	13:45	0.99	1.10	11	1.06	1.31	24	1.06	1.26	19	1.03	1.25	21	1.02	1.26	24	0.99	1.32	33
87	21/6/2009	S/SW	10:00	12:45	0.91	1.18	30	0.79	0.65	-18	0.78	0.62	-21	0.77	0.61	-21	0.77	0.61	-21	0.77	0.62	-19
88	22/7/2009	N	8:50	14:25	0.81	0.96	19	0.93	1.51	62	0.93	1.65	77	0.92	1.76	91	0.92	1.81	97	0.90	1.88	109
89	29/7/2009	N	10:55	12:05	0.97	1.18	22	1.06	1.25	18	1.05	1.24	18	1.02	1.24	22	1.02	1.25	23	1.04	1.27	22
90	7/6/2010	N	11:05	12:20	1.03	1.29	25	1.04	1.75	68	1.03	2.00	94	1.01	2.17	115	1.01	2.21	119	1.00	2.32	132
91	5/7/2010	N	9:10	15:15	1.03	1.22	18	1.09	1.15	6	1.08	1.12	4	1.08	1.10	2	1.07	1.09	2	1.07	1.09	2
92	24/7/2010	N	9:00	10:35	1.01	1.12	11	0.98	0.99	1	0.97	0.90	-7	0.96	0.89	-7	0.96	0.88	-8	0.95	0.88	-7
93	18/8/2010	NW	8:20	9:55	1.39	2.37	71	1.52	1.90	25	1.50	1.75	17	1.46	1.62	11	1.43	1.56	9	1.46	1.53	5
94	30/8/2010	W	10:40	12:30	1.27	1.72	35	1.42	2.02	42	1.41	1.90	35	1.43	1.96	37	1.39	1.88	35	1.38	1.93	40
95	27/6/2011	N	10:15	12:40	1.01	1.36	35	1.03	1.41	37	1.03	1.32	28	1.02	1.28	25	1.01	1.26	25	1.00	1.18	18
96	11/7/2011	NE	9:45	10:55	1.05	1.27	21	1.11	1.30	17	1.09	1.28	17	1.08	1.29	19	1.07	1.29	21	1.03	1.28	24
97	16/7/2011	NE	8:25	10:55	1.09	1.38	27	1.13	1.58	40	1.12	1.62	45	1.10	1.68	53	1.10	1.71	55	1.12	1.81	62
98	18/7/2011	NE	8:20	9:55	0.93	0.95	2	0.95	0.98	3	0.92	0.94	2	0.92	0.93	1	0.91	0.93	2	0.90	0.91	1
99	22/7/2011	NW	7:15	9:05	0.84	0.93	11	0.86	0.95	10	0.85	1.02	20	0.86	1.07	24	0.86	1.05	22	0.87	1.03	18
100	26/7/2011	W	8:45	13:20	0.85	1.35	59	0.88	1.45	65	0.88	1.59	81	0.87	1.70	95	0.87	1.74	100	0.86	1.80	109
101	14/6/2012	W	9:25	11:25	1.06	1.81	71	0.97	1.58	63	0.95	1.54	62	0.93	1.51	62	0.94	1.53	63	0.94	1.53	63
102	16/6/2012	NE	8:50	9:40	0.92	0.89	-3	0.95	0.99	4	0.94	0.99	5	0.94	1.02	9	0.94	1.03	10	0.94	1.05	12
103	17/6/2012	S/SW	8:25	15:20	0.93	0.78	-16	0.90	1.09	21	0.88	1.21	38	0.87	1.29	48	0.87	1.33	53	0.85	1.48	74
104	18/6/2012	NE	8:20	10:25	1.04	1.40	35	1.02	1.35	32	1.00	1.25	25	1.00	1.19	19	0.99	1.17	18	0.97	1.13	16
105	19/6/2012	N	11:00	12:40	1.08	1.14	6	1.06	1.14	8	1.05	1.13	8	1.04	1.11	7	1.04	1.10	6	1.03	1.08	5
106	24/6/2012	NE	8:55	11:15	1.01	1.06	5	1.02	1.11	9	1.01	1.08	7	1.00	1.06	6	1.00	1.06	6	1.00	1.05	5
107	27/6/2012	N	6:45	9:50	0.98	1.29	32	1.01	1.66	64	1.01	1.76	74	1.02	1.83	79	1.02	1.85	81	1.04	1.91	84
108	29/6/2012	NE	9:50	10:30	1.03	0.92	-11	1.02	1.40	37	1.03	1.45	41	1.01	1.40	39	1.01	1.40	39	1.00	1.41	41
109	19/7/2012	W	9:05	10:45	0.92	1.07	16	0.92	1.31	42	0.91	1.36	49	0.91	1.48	63	0.90	1.52	69	0.90	1.65	83
110	31/7/2012	NE	8:40	10:05	0.86	1.03	20	0.97	1.05	8	1.04	1.07	3	1.03	1.13	10	1.02	1.16	14	1.03	1.29	25
111	1/8/2012	NE	8:30	9:10	0.99	1.21	22	1.13	1.42	26	1.14	1.34	18	1.13	1.32	17	1.13	1.32	17	1.12	1.30	16
112	19/8/2012	N	9:15	13:45	0.78	0.87	12	0.65	0.76	17	0.67	0.89	33	0.69	0.98	42	0.69	1.06	54	0.71	1.19	68

113	20/8/2012	N	7:20	16:55	0.26	0.37	42	0.22	0.35	59	0.24	0.39	63	0.27	0.45	67	0.28	0.47	68	0.32	0.54	69
114	25/8/2012	NE	9:15	11:00	1.16	1.52	31	1.16	2.18	88	1.15	2.18	90	1.13	2.15	90	1.12	2.14	91	1.14	2.14	88
115	29/8/2012	N	8:30	13:30	0.89	0.90	1	0.94	1.09	16	1.02	1.21	19	1.04	1.25	20	1.03	1.26	22	0.99	1.39	40
116	30/8/2012	NE	8:30	13:40	0.87	1.25	44	0.87	1.47	69	0.85	1.35	59	0.85	1.38	62	0.86	1.37	59	0.86	1.36	58
117	31/8/2012	N	10:10	11:15	1.09	1.82	67	1.03	1.61	56	0.97	1.40	44	0.93	1.27	37	0.92	1.25	36	0.89	1.25	40
118	26/6/2013	N	9:20	11:50	1.05	1.49	42	0.99	1.37	38	0.99	1.28	29	0.98	1.24	27	0.98	1.23	26	0.98	1.19	21
119	23/7/2013	N	8:30	14:55	0.79	0.66	-16	0.81	1.48	83	0.81	1.56	93	0.80	1.64	105	0.81	1.66	105	0.82	1.75	113
120	24/7/2013	N	8:40	11:10	1.09	1.28	17	1.15	1.61	40	1.14	1.69	48	1.13	1.78	58	1.13	1.82	61	1.13	1.95	73
121	28/7/2013	NE	9:25	12:00	1.02	1.25	23	0.92	1.65	79	0.90	1.68	87	0.89	1.70	91	0.89	1.70	91	0.90	1.76	96
122	30/7/2013	NE	9:40	11:00	1.08	1.33	23	1.08	1.27	18	1.07	1.26	18	1.05	1.27	21	1.05	1.28	22	1.05	1.30	24
123	2/8/2013	NE	9:35	10:40	0.92	1.10	20	0.81	0.94	16	0.80	0.95	19	0.79	1.02	29	0.79	1.04	32	0.79	1.11	41
124	4/8/2013	NE	8:35	10:45	1.11	1.67	50	1.10	1.79	63	1.08	1.64	52	1.06	1.56	47	1.05	1.53	46	1.04	1.50	44
125	6/8/2013	NE	8:45	10:10	1.01	1.60	58	0.97	1.15	19	0.96	1.09	14	0.95	1.03	8	0.94	1.02	9	0.93	1.01	9
126	24/6/2014	N	9:30	13:25	1.10	1.21	10	1.07	1.15	7	1.05	1.10	5	1.04	1.11	7	1.03	1.12	9	1.01	1.15	14
Autumn																						
127	9/9/2008	N	10:00	15:25	1.05	1.19	13	0.99	1.08	9	0.97	1.05	8	0.95	1.05	11	0.95	1.06	12	0.95	1.10	16
128	10/9/2008	NE	10:05	14:45	0.92	0.86	-7	0.97	0.85	-12	0.97	0.93	-4	0.96	1.10	15	0.95	1.16	22	0.95	1.32	39
129	12/9/2008	N	9:45	14:55	1.30	1.75	35	0.98	1.00	2	0.96	0.95	-1	0.95	0.92	-3	0.95	0.91	-4	0.94	0.90	-4
130	23/9/2008	NW	9:20	12:55	1.01	1.31	30	1.05	1.98	89	1.03	2.06	100	1.01	2.15	113	1.00	2.18	118	1.02	2.29	125
131	7/10/2008	N	10:30	13:35	1.28	1.50	17	1.29	1.59	23	1.26	1.51	20	1.21	1.50	24	1.21	1.53	26	1.24	1.73	40
132	12/10/2008	NE	10:20	13:20	0.95	0.96	1	0.95	1.38	45	0.94	2.09	122	0.95	2.64	178	0.96	3.05	218	0.98	4.08	316
133	13/10/2008	NE	12:30	16:10	1.04	1.05	1	0.93	1.06	14	0.93	1.06	14	0.92	1.07	16	0.91	1.07	18	0.91	1.22	34
134	25/10/2008	N	13:05	17:00	1.00	1.28	28	1.07	1.49	39	1.08	1.51	40	1.09	1.55	42	1.09	1.58	45	1.09	1.68	54
135	24/11/2008	W	12:00	14:45	1.05	0.96	-9	1.30	1.39	7	1.29	1.33	3	1.26	1.30	3	1.25	1.29	3	1.26	1.34	6
136	5/10/2009	NW	7:40	17:00	1.02	2.43	138	1.63	5.40	231	1.65	5.15	212	1.65	5.00	203	1.66	4.97	199	1.68	4.87	190
137	18/10/2009	E	8:05	9:35	1.20	1.73	44	1.25	1.98	58	1.30	2.04	57	1.37	2.13	55	1.39	2.18	57	1.49	2.61	75
138	19/10/2009	S/SW	9:20	11:45	1.10	1.20	9	1.16	1.27	9	1.17	1.21	3	1.14	1.18	4	1.14	1.17	3	1.14	1.16	2
139	20/10/2009	S/SW	9:35	11:35	0.92	0.90	-2	0.92	0.89	-3	0.90	1.90	111	0.90	0.94	4	0.90	1.01	12	0.91	1.28	41
140	24/9/2010	S/SW	8:30	12:35	1.02	1.06	4	1.08	1.27	18	1.07	1.29	21	1.07	1.32	23	1.08	1.36	26	1.09	1.39	28
141	6/10/2010	N	8:20	10:00	1.12	1.42	27	1.03	1.07	4	1.02	1.00	-2	1.01	0.99	-2	1.01	0.97	-4	1.01	0.96	-5
142	9/10/2010	N	11:25	15:45	0.97	1.19	23	1.12	1.51	35	1.17	1.55	32	1.18	1.52	29	1.18	1.50	27	1.14	1.42	25
143	12/10/2010	S/SW	9:55	10:25	0.98	1.45	48	1.03	1.50	46	1.04	1.52	46	1.04	1.54	48	1.04	1.56	50	1.06	1.58	49
144	15/10/2010	S/SW	12:25	15:50	0.75	1.15	53	1.00	2.22	122	1.13	2.49	120	1.10	3.01	174	1.14	3.25	185	1.22	4.56	274
145	28/10/2010	W	8:50	11:50	0.94	1.07	14	0.96	1.22	27	1.03	1.35	31	1.05	1.40	33	1.06	1.49	41	1.07	1.57	47
146	1/11/2011	N	11:20	17:45	1.08	1.41	31	1.11	1.63	47	1.10	1.59	45	1.10	1.69	54	1.10	1.70	55	1.14	1.71	50

147	10/11/2011	N	6:35	9:40	0.93	1.24	33	0.92	1.35	47	0.92	1.33	45	0.92	1.31	42	0.97	1.31	35	1.00	1.29	29
148	13/11/2011	NW	5:35	8:45	1.08	1.47	36	1.13	1.67	48	1.12	1.61	44	1.12	1.59	42	1.12	1.38	23	1.15	1.39	21
149	9/9/2012	W	9:20	11:35	0.98	1.26	29	1.04	1.61	55	1.04	1.51	45	1.02	1.41	38	1.02	1.39	36	0.99	1.36	37
150	20/9/2012	W	9:00	11:20	1.02	1.17	15	1.13	1.30	15	1.12	1.25	12	1.11	1.25	13	1.11	1.24	12	1.12	1.24	11
151	22/9/2012	NW	9:35	12:45	0.88	0.99	13	0.88	1.04	18	0.87	0.91	5	0.87	0.86	-1	0.87	0.83	-5	0.86	0.77	-10
152	3/11/2012	S/SW	8:25	10:10	1.16	1.53	32	1.21	2.32	92	1.18	1.93	64	1.18	1.75	48	1.19	1.72	45	1.26	1.68	33
153	10/11/2012	N	12:50	14:55	1.62	1.76	9	1.85	1.98	7	1.87	1.97	5	1.88	1.94	3	1.90	1.92	1	1.93	1.97	2
154	21/11/2012	S/SW	10:30	13:30	0.94	0.76	-19	1.33	1.92	44	1.41	2.25	60	1.46	3.09	112	1.49	3.66	146	1.61	6.00	273
155	18/10/2013	NW	9:00	10:20	1.21	1.79	48	1.22	1.74	43	1.25	1.67	34	1.26	1.74	38	1.25	1.78	42	1.21	2.22	83
156	20/10/2013	N	9:25	10:00	0.94	0.99	5	0.99	1.17	18	0.99	1.07	8	0.98	0.99	1	0.97	0.98	1	0.97	0.93	-4
157	8/11/2013	NE	10:00	11:05	0.98	1.19	21	1.30	2.24	72	1.25	1.67	34	1.18	1.31	11	1.16	1.24	7	1.11	1.12	1
158	12/9/2014	N	9:15	15:55	0.61	0.85	39	0.53	0.85	60	0.55	0.85	55	0.55	0.85	55	0.57	0.85	49	0.61	0.85	39
159	19/10/2014	N	6:35	9:35	1.07	1.36	27	1.11	1.52	37	1.11	1.51	36	1.12	1.48	32	1.12	1.47	31	1.14	1.51	32
160	20/10/2014	N	9:10	14:30	0.83	1.01	22	0.99	1.41	42	1.04	1.53	47	1.04	1.79	72	1.06	1.96	85	1.10	2.61	137
161	1/11/2014	NE	9:10	14:00	1.28	1.86	45	1.28	3.22	152	1.27	4.06	220	1.30	4.76	266	1.30	5.03	287	1.28	5.58	336
162	14/11/2014	NW	8:40	10:20	0.79	1.02	29	0.82	1.14	39	0.79	1.05	33	0.80	1.01	26	0.89	0.98	10	0.88	0.97	10

Table S3. Seasonal decoupling time (t_{dec}), t_{Nd} when NPF starts to influence the cloud droplet number concentrations (N_d), average N_d and the estimated maximum supersaturation in the cloud (s_{max}) before (bef) being the time step between t_{dec} and t_{Nd} , and after (aft) being the time step between t_{Nd} and the end of N_d production, and the increase of the N_d and s_{max} (%) observed after the t_{Nd} . Two probability density functions (PDFs) of the characteristic updraft velocity are used with $\sigma_w=0.3 \text{ m s}^{-1}$ and $\sigma_w=0.6 \text{ m s}^{-1}$. Time is in LT.

Date	t_{det} (LT)	t_{Nd} (LT)	N_d (cm^{-3}) (bef)	N_d (cm^{-3}) (aft)	Change of N_d (%)	S_{max} (%) (bef)	S_{max} (%) (aft)	Change of S_{max} (%)	$\sigma_w = 0.3 \text{ m s}^{-1}$		$\sigma_w = 0.6 \text{ m s}^{-1}$				
									N_d (cm^{-3}) (bef)	N_d (cm^{-3}) (aft)	S_{max} (%) (bef)	S_{max} (%) (aft)	Change of N_d (%)		
<i>Winter</i>															
1	4/12/2008	12:05	15:05	480	493	2.7	0.06	0.06	0.0	854	856	0.2	0.08	0.08	0.0
2	13/12/2008	12:55	16:15	162	236	45.7	0.19	0.17	-10.5	215	346	60.9	0.29	0.24	-17.2
3	26/12/2009	14:55	15:35	213	294	38.0	0.18	0.16	-11.1	307	418	36.2	0.09	0.07	-22.2
4	19/2/2010	16:15	17:45	368	395	7.3	0.13	0.11	-15.4	522	631	20.9	0.21	0.19	-9.5
5	26/2/2010	14:10	18:40	292	305	4.5	0.15	0.14	-6.7	440	462	5.0	0.21	0.20	-4.8

6	3/1/2011	15:55	19:50	285	299
7	6/1/2011	15:35	17:20	190	227
8	17/1/2011	14:20	17:50	288	314
9	19/1/2011	17:40	18:10	236	338
10	1/2/2011	17:00	18:15	255	270
11	7/2/2011	14:40	15:10	473	483
12	10/2/2011	16:30	17:25	458	484
13	11/2/2011	17:15	18:20	331	452
14	1/1/2012	-	-	-	-
15	26/1/2012	-	-	-	-
16	21/1/2013	11:50	17:50	446	464
17	23/1/2013	12:10	14:55	476	497
18	8/1/2014	14:30	17:35	308	342
19	10/1/2014	12:50	15:55	436	487
20	23/1/2014	11:25	16:05	361	395
21	30/1/2014	12:15	15:45	451	484
22	22/12/2014	12:30	17:50	293	315
23	11/1/2015	11:50	16:20	300	312
24	23/1/2015	10:50	11:45	492	516

Spring

25	14/3/2009	12:30	17:20	441	490
26	19/3/2009	14:05	17:35	462	491
27	30/3/2009	14:40	15:20	485	507
28	22/5/2009	10:45	15:20	469	493
29	28/5/2009	8:35	9:25	429	452
30	13/3/2010	11:50	12:35	311	315
31	16/3/2010	12:55	15:15	367	388
32	18/3/2010	14:00	15:20	348	380
33	19/3/2010	16:05	17:45	413	467
34	22/3/2010	12:15	16:50	457	463
35	27/3/2010	12:55	17:25	316	320
36	30/3/2010	11:30	12:15	246	297
37	7/4/2010	12:15	15:55	278	287
38	8/4/2010	13:30	14:25	355	439
39	9/4/2010	12:05	16:20	348	397

4.9	0.14	0.13	-7.1	408	439	7.6	0.21	0.20	-4.8
19.5	0.20	0.19	-5.0	275	344	25.1	0.29	0.27	-6.9
9.0	0.15	0.14	-6.7	415	456	9.9	0.21	0.19	-9.5
43.2	0.18	0.15	-16.7	336	507	50.9	0.25	0.20	-20.0
5.9	0.17	0.16	-5.9	365	390	6.8	0.25	0.24	-4.0
2.1	0.13	0.11	-15.4	698	813	16.5	0.16	0.15	-6.3
5.7	0.12	0.10	-16.7	657	824	25.4	0.16	0.15	-6.3
36.6	0.14	0.13	-7.1	507	617	21.7	0.20	0.18	-10.0
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
4.0	0.11	0.10	-9.1	696	715	2.7	0.15	0.13	-13.3
4.4	0.12	0.11	-8.3	823	849	3.2	0.17	0.16	-5.9
11.0	0.14	0.13	-7.1	611	723	18.3	0.19	0.18	-5.3
11.7	0.13	0.11	-15.4	573	689	20.2	0.22	0.20	-9.1
9.4	0.12	0.11	-8.3	459	527	14.8	0.21	0.19	-9.5
7.3	0.15	0.14	-6.7	572	651	13.8	0.19	0.18	-5.3
7.5	0.16	0.15	-6.3	457	495	8.3	0.22	0.21	-4.5
4.0	0.12	0.11	-8.3	464	477	2.8	0.19	0.18	-5.3
4.9	0.06	0.05	-16.7	876	925	5.6	0.08	0.07	-12.5

11.1	0.14	0.13	-7.1	583	659	13.0	0.18	0.17	-5.6
6.3	0.15	0.14	-6.7	547	631	15.4	0.20	0.19	-5.0
4.5	0.06	0.05	-16.7	874	923	5.6	0.08	0.07	-12.5
5.1	0.12	0.10	-16.7	614	679	10.6	0.16	0.15	-6.3
5.4	0.10	0.09	-10.0	625	779	24.6	0.15	0.13	-13.3
1.3	0.13	0.13	0.0	473	481	1.7	0.19	0.18	-5.3
5.7	0.14	0.14	0.0	497	501	0.8	0.19	0.18	-5.3
9.2	0.14	0.14	0.0	459	471	2.6	0.20	0.19	-5.0
13.1	0.16	0.15	-6.3	596	678	13.8	0.21	0.19	-9.5
1.3	0.11	0.12	9.1	620	763	23.1	0.15	0.16	6.7
1.3	0.13	0.13	0.0	476	482	1.3	0.19	0.18	-5.3
20.7	0.14	0.12	-14.3	365	443	21.4	0.19	0.17	-10.5
3.2	0.16	0.15	-6.3	398	414	4.0	0.22	0.21	-4.5
23.7	0.13	0.10	-23.1	497	652	31.2	0.17	0.15	-11.8
14.1	0.14	0.12	-14.3	479	531	10.9	0.19	0.17	-10.5

40	15/4/2010	14:25	16:40	310	325	4.8	0.11	0.09	-18.2	380	433	13.9	0.16	0.14	-12.5
41	17/4/2010	13:35	14:40	260	344	32.3	0.12	0.09	-25.0	384	607	58.1	0.16	0.13	-18.8
42	29/4/2010	13:50	15:05	379	463	22.2	0.13	0.12	-7.7	561	663	18.2	0.17	0.16	-5.9
43	1/5/2010	10:40	15:15	437	450	3.0	0.11	0.10	-9.1	639	691	8.1	0.15	0.14	-6.7
44	30/5/2010	9:40	14:30	337	368	9.2	0.10	0.09	-10.0	451	548	21.5	0.14	0.13	-7.1
45	9/3/2011	11:50	14:10	267	341	27.7	0.14	0.13	-7.1	386	471	22.0	0.21	0.20	-4.8
46	19/3/2011	12:05	14:30	284	310	9.2	0.14	0.14	0.0	466	509	9.2	0.19	0.19	0.0
47	29/3/2011	13:00	15:15	274	323	17.9	0.12	0.12	0.0	404	443	9.7	0.17	0.16	-5.9
48	12/4/2011	13:45	19:25	336	483	43.8	0.14	0.12	-14.3	503	652	29.6	0.19	0.16	-15.8
49	3/5/2011	12:30	17:05	432	479	10.9	0.15	0.13	-13.3	567	631	11.3	0.20	0.19	-5.0
50	4/5/2011	13:50	14:45	176	273	55.1	0.17	0.14	-17.6	268	409	52.6	0.23	0.19	-17.4
51	14/5/2011	10:50	13:45	336	361	7.4	0.13	0.12	-7.7	528	601	13.8	0.18	0.17	-5.6
52	25/4/2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-
53	1/5/2012	12:05	16:35	418	441	5.5	0.11	0.10	-9.1	601	697	16.0	0.18	0.17	-5.6
54	14/5/2012	10:55	15:25	406	431	6.2	0.12	0.10	-16.7	582	656	12.7	0.19	0.18	-5.3
55	6/3/2013	12:00	17:20	234	243	3.8	0.18	0.17	-5.6	364	367	0.8	0.25	0.24	-4.0
56	10/3/2013	11:45	14:25	176	260	47.7	0.19	0.15	-21.1	269	435	61.7	0.26	0.19	-26.9
57	13/3/2013	13:15	16:05	214	252	17.8	0.17	0.16	-5.9	347	416	19.9	0.23	0.21	-8.7
58	23/3/2013	14:50	18:20	223	240	7.6	0.19	0.18	-5.3	366	394	7.7	0.25	0.24	-4.0
59	24/3/2013	9:30	18:05	300	379	26.3	0.14	0.13	-7.1	508	614	20.9	0.19	0.17	-10.5
60	27/3/2013	13:50	15:45	384	419	9.1	0.11	0.10	-9.1	632	698	10.4	0.17	0.16	-5.9
61	5/4/2013	12:20	15:10	236	254	7.6	0.13	0.12	-7.7	380	421	10.8	0.18	0.17	-5.6
62	19/4/2013	13:10	14:00	435	462	6.2	0.12	0.09	-25.0	600	758	26.3	0.18	0.15	-16.7
63	21/4/2013	15:00	17:15	469	492	4.9	0.09	0.08	-11.1	774	813	5.0	0.15	0.13	-13.3
64	1/5/2013	11:45	19:10	432	442	2.3	0.07	0.06	-14.3	751	756	0.7	0.10	0.09	-10.0
65	22/5/2013	15:30	17:15	228	241	5.7	0.11	0.10	-9.1	346	356	2.9	0.15	0.14	-6.7
66	13/3/2014	20:05	21:35	546	558	2.2	0.12	0.12	0.0	983	1006	2.3	0.16	0.16	0.0
67	21/3/2014	21:05	21:45	453	464	2.4	0.13	0.13	0.0	588	622	5.8	0.17	0.17	0.0
68	23/3/2014	10:15	15:50	493	503	2.0	0.09	0.08	-11.1	897	920	2.6	0.13	0.12	-7.7
69	30/3/2014	13:05	18:15	322	327	1.6	0.16	0.15	-6.3	486	517	6.4	0.21	0.20	-4.8
70	2/5/2014	13:35	15:20	316	378	19.6	0.12	0.11	-8.3	455	502	10.3	0.15	0.15	0.0
71	21/5/2014	10:15	16:50	440	456	3.6	0.09	0.08	-11.1	732	787	7.5	0.13	0.13	0.0
72	23/5/2014	12:30	15:40	418	427	2.2	0.10	0.09	-10.0	741	745	0.5	0.14	0.13	-7.1
73	25/5/2014	11:25	12:50	264	307	16.3	0.14	0.12	-14.3	356	434	21.9	0.18	0.16	-11.1
74	26/5/2014	11:40	16:25	350	379	8.3	0.07	0.06	-14.3	567	621	9.5	0.12	0.11	-8.3

75	30/4/2015	9:35	11:05	365	419	14.8	0.12	0.10	-16.7	450	623	38.4	0.16	0.15	-6.3
76	2/5/2015	10:15	12:20	384	417	8.6	0.12	0.10	-16.7	504	656	30.2	0.16	0.15	-6.3
Summer															
77	9/6/2008	14:45	17:00	458	521	13.8	0.05	0.03	-40.0	836	856	2.4	0.07	0.05	-28.6
78	15/6/2008	9:50	14:25	378	387	2.4	0.07	0.07	0.0	594	602	1.3	0.12	0.11	-8.3
79	16/6/2008	10:20	16:20	424	478	12.7	0.07	0.05	-28.6	770	878	14.0	0.09	0.07	-22.2
80	20/6/2008	12:05	16:25	434	476	9.7	0.06	0.05	-16.7	794	881	11.0	0.08	0.06	-25.0
81	24/7/2008	9:30	13:40	376	432	14.9	0.11	0.09	-18.2	532	729	37.0	0.14	0.12	-14.3
82	25/7/2008	11:00	12:30	422	432	2.4	0.10	0.10	0.0	645	754	16.9	0.14	0.13	-7.1
83	26/7/2008	9:50	13:40	442	456	3.2	0.08	0.07	-12.5	811	855	5.4	0.11	0.09	-18.2
84	30/7/2008	12:40	16:20	446	457	2.5	0.07	0.06	-14.3	781	794	1.7	0.10	0.09	-10.0
85	15/6/2009	14:10	15:40	412	445	8.0	0.09	0.08	-11.1	745	829	11.3	0.13	0.11	-15.4
86	19/6/2009	13:45	15:20	279	329	17.9	0.12	0.12	0.0	453	498	9.9	0.16	0.15	-6.3
87	21/6/2009	12:45	16:20	389	408	4.9	0.07	0.07	0.0	692	710	2.6	0.11	0.10	-9.1
88	22/7/2009	14:25	17:00	370	403	8.9	0.10	0.09	-10.0	510	647	26.9	0.14	0.13	-7.1
89	29/7/2009	12:05	15:55	452	494	9.3	0.09	0.08	-11.1	764	853	11.6	0.10	0.09	-10.0
90	7/6/2010	12:20	13:00	441	453	2.7	0.08	0.07	-12.5	761	805	5.8	0.13	0.12	-7.7
91	5/7/2010	15:15	19:25	424	431	1.7	0.06	0.06	0.0	718	728	1.4	0.09	0.09	0.0
92	24/7/2010	10:35	14:00	399	412	3.3	0.06	0.05	-16.7	712	732	2.8	0.08	0.07	-12.5
93	18/8/2010	9:55	10:45	361	380	5.3	0.07	0.06	-14.3	639	680	6.4	0.11	0.09	-18.2
94	30/8/2010	12:30	14:30	310	333	7.4	0.11	0.10	-9.1	664	702	5.7	0.13	0.12	-7.7
95	27/6/2011	12:40	14:15	419	441	5.3	0.10	0.09	-10.0	671	722	7.6	0.14	0.13	-7.1
96	11/7/2011	10:55	12:05	406	421	3.7	0.09	0.08	-11.1	622	703	13.0	0.14	0.13	-7.1
97	16/7/2011	10:55	12:30	382	397	3.9	0.10	0.10	0.0	502	569	13.3	0.12	0.11	-8.3
98	18/7/2011	9:55	12:15	393	417	6.1	0.08	0.07	-12.5	701	757	8.0	0.10	0.09	-10.0
99	22/7/2011	9:05	15:10	421	441	4.8	0.07	0.06	-14.3	723	771	6.6	0.10	0.09	-10.0
100	26/7/2011	13:20	14:40	438	451	3.0	0.09	0.08	-11.1	807	831	3.0	0.11	0.10	-9.1
101	14/6/2012	11:25	13:20	431	449	4.2	0.06	0.05	-16.7	808	849	5.1	0.08	0.07	-12.5
102	16/6/2012	9:40	15:05	423	438	3.5	0.07	0.06	-14.3	751	793	5.6	0.10	0.09	-10.0
103	17/6/2012	15:20	17:00	385	397	3.1	0.09	0.09	0.0	656	671	2.3	0.14	0.13	-7.1
104	18/6/2012	10:25	11:25	278	353	27.0	0.12	0.11	-8.3	435	473	8.7	0.16	0.15	-6.3
105	19/6/2012	12:40	14:45	410	423	3.2	0.09	0.08	-11.1	754	782	3.7	0.12	0.12	0.0
106	24/6/2012	11:15	16:25	444	453	2.0	0.05	0.05	0.0	795	808	1.6	0.07	0.07	0.0
107	27/6/2012	9:50	12:25	413	438	6.1	0.06	0.05	-16.7	733	782	6.7	0.08	0.07	-12.5
108	29/6/2012	10:30	16:50	411	428	4.1	0.08	0.07	-12.5	698	764	9.5	0.12	0.11	-8.3

109	19/7/2012	10:45	11:50	395	408	3.3	0.09	0.08	-11.1	612	713	16.5	0.14	0.13	-7.1
110	31/7/2012	10:05	12:55	416	428	2.9	0.06	0.06	0.0	725	761	5.0	0.09	0.09	0.0
111	1/8/2012	9:10	17:15	419	437	4.3	0.07	0.06	-14.3	750	803	7.1	0.10	0.09	-10.0
112	19/8/2012	13:45	17:00	387	409	5.7	0.09	0.08	-11.1	633	700	10.6	0.13	0.12	-7.7
113	20/8/2012	16:55	20:05	430	446	3.7	0.11	0.09	-18.2	626	819	30.8	0.14	0.12	-14.3
114	25/8/2012	11:00	17:35	413	421	1.9	0.06	0.06	0.0	734	753	2.6	0.09	0.09	0.0
115	29/8/2012	13:30	17:25	231	285	22.8	0.13	0.12	-5.7	356	419	17.7	0.18	0.17	-5.6
116	30/8/2012	13:40	16:50	274	326	19.0	0.12	0.11	-8.3	464	526	13.4	0.16	0.15	-6.3
117	31/8/2012	11:15	12:35	327	418	27.8	0.11	0.10	-9.1	535	669	25.0	0.14	0.13	-7.1
118	26/6/2013	11:50	16:25	396	417	5.3	0.08	0.08	0.0	699	750	7.3	0.12	0.11	-8.3
119	23/7/2013	14:55	16:30	322	392	21.7	0.11	0.10	-9.1	468	535	14.3	0.15	0.14	-6.7
120	24/7/2013	11:10	15:55	430	437	1.6	0.08	0.07	-12.5	768	783	2.0	0.11	0.10	-9.1
121	28/7/2013	12:00	17:25	379	403	6.3	0.07	0.06	-14.3	609	676	11.0	0.11	0.10	-9.1
122	30/7/2013	11:00	12:40	403	413	2.5	0.05	0.05	0.0	689	718	4.2	0.08	0.07	-12.5
123	2/8/2013	10:40	13:30	408	430	5.4	0.06	0.05	-16.7	704	770	9.4	0.09	0.08	-11.1
124	4/8/2013	10:45	13:35	432	450	4.2	0.06	0.05	-16.7	768	812	5.7	0.08	0.07	-12.5
125	6/8/2013	10:10	13:30	428	447	4.4	0.08	0.07	-12.5	782	801	2.4	0.12	0.10	-16.7
126	24/6/2014	13:25	14:30	458	462	0.9	0.06	0.05	-16.7	827	840	1.6	0.09	0.07	-22.2

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127	9/9/2008	15:25	19:25	401	411	2.5	0.06	0.06	0.0	681	703	3.2	0.10	0.10	0.0
128	10/9/2008	14:45	17:00	397	408	2.8	0.08	0.07	-12.5	690	709	2.8	0.12	0.11	-8.3
129	12/9/2008	14:55	15:55	452	468	3.5	0.05	0.04	-20.0	812	848	4.4	0.07	0.07	0.0
130	23/9/2008	12:55	16:30	373	397	6.4	0.10	0.09	-10.0	455	559	22.9	0.15	0.14	-6.7
131	7/10/2008	13:35	14:10	459	469	2.2	0.12	0.11	-8.3	655	683	4.3	0.15	0.14	-6.7
132	12/10/2008	13:20	21:10	422	431	2.1	0.09	0.08	-11.1	603	678	12.4	0.15	0.13	-13.3
133	13/10/2008	16:10	20:55	439	452	3.0	0.08	0.07	-12.5	684	704	2.9	0.12	0.11	-8.3
134	25/10/2008	17:00	19:25	438	456	4.1	0.09	0.08	-11.1	595	698	17.3	0.15	0.14	-6.7
135	24/11/2008	14:45	17:00	230	310	34.8	0.15	0.13	-13.3	315	475	50.8	0.22	0.18	-18.2
136	5/10/2009	17:00	17:50	396	427	7.8	0.09	0.08	-11.1	727	801	10.2	0.13	0.12	-7.7
137	18/10/2009	9:35	10:15	238	280	17.6	0.13	0.12	-7.7	359	409	13.9	0.18	0.16	-11.1
138	19/10/2009	11:45	16:30	364	372	2.2	0.12	0.11	-8.3	419	449	7.2	0.16	0.15	-6.3
139	20/10/2009	11:35	13:40	281	302	7.5	0.12	0.11	-8.3	369	386	4.6	0.18	0.17	-5.6
140	24/9/2010	12:35	19:30	398	407	2.3	0.08	0.08	0.0	594	602	1.3	0.14	0.13	-7.1
141	6/10/2010	10:00	14:55	365	404	10.7	0.09	0.08	-11.1	538	629	16.9	0.14	0.13	-7.1
142	9/10/2010	15:45	16:20	323	402	24.5	0.13	0.12	-7.7	446	497	11.4	0.18	0.17	-5.6

143	12/10/2010	10:25	11:35	200	222	11.0	0.12	0.11	-8.3	294	330	12.2	0.17	0.16	-5.9
144	15/10/2010	15:50	19:40	203	229	12.8	0.14	0.13	-7.1	291	318	9.3	0.20	0.19	-5.0
145	28/10/2010	11:50	16:15	157	183	16.6	0.19	0.18	-5.3	202	247	22.3	0.28	0.26	-7.1
146	1/11/2011	17:45	18:55	352	439	24.7	0.14	0.13	-7.1	527	631	19.7	0.20	0.18	-10.0
147	10/11/2011	9:40	10:55	259	311	20.1	0.13	0.12	-7.7	376	431	14.6	0.18	0.17	-5.6
148	13/11/2011	8:45	10:25	409	463	13.2	0.10	0.09	-10.0	606	739	21.9	0.15	0.14	-6.7
149	9/9/2012	11:35	12:50	406	422	3.9	0.10	0.09	-10.0	569	693	21.8	0.14	0.13	-7.1
150	20/9/2012	11:20	16:50	428	446	4.2	0.07	0.06	-14.3	705	728	3.3	0.11	0.10	-9.1
151	22/9/2012	12:45	16:50	393	416	5.9	0.10	0.09	-10.0	479	568	18.6	0.14	0.13	-7.1
152	3/11/2012	10:10	13:40	413	421	1.9	0.11	0.10	-9.1	579	694	19.9	0.14	0.13	-7.1
153	10/11/2012	14:55	16:35	240	309	28.8	0.15	0.14	-6.7	385	515	33.8	0.21	0.19	-9.5
154	21/11/2012	13:30	17:25	223	279	25.1	0.14	0.13	-7.1	288	439	52.4	0.22	0.18	-18.2
155	18/10/2013	10:20	13:20	266	365	37.2	0.13	0.12	-7.7	383	443	15.7	0.18	0.16	-11.1
156	20/10/2013	10:00	12:15	413	459	11.1	0.12	0.11	-8.3	576	619	7.5	0.16	0.15	-6.3
157	8/11/2013	11:05	13:15	209	244	16.7	0.17	0.16	-5.9	365	456	24.9	0.23	0.20	-13.0
158	12/9/2014	15:55	18:10	391	407	4.1	0.10	0.06	-40.0	573	602	5.1	0.10	0.09	-10.0
159	19/10/2014	9:35	10:55	259	301	16.2	0.14	0.13	-7.1	378	427	13.0	0.18	0.17	-5.6
160	20/10/2014	14:30	16:40	368	421	14.4	0.09	0.08	-11.1	671	718	7.0	0.13	0.12	-7.7
161	1/11/2014	14:00	17:25	425	455	7.1	0.08	0.07	-12.5	626	735	17.4	0.15	0.12	-20.0
162	14/11/2014	10:20	13:10	296	402	35.8	0.14	0.13	-7.1	483	569	17.8	0.19	0.17	-10.5

Table S4. Variance of N_d and relative contribution to this variance of aerosol number (N_{total}) and chemical composition (κ) during all the NPF events from May 2012 to May 2015, based on the ACSM measurements.

<i>Date</i>		<i>Variance N_d</i>		<i>Contribution of κ</i>		<i>Contribution of N_{total}</i>	
		$\sigma_w = 0.3 \text{ m s}^{-1}$	$\sigma_w = 0.6 \text{ m s}^{-1}$	$\sigma_w = 0.3 \text{ m s}^{-1}$	$\sigma_w = 0.6 \text{ m s}^{-1}$	$\sigma_w = 0.3 \text{ m s}^{-1}$	$\sigma_w = 0.6 \text{ m s}^{-1}$
Winter							
1	22/12/2014	94.4	146.9	12.0 %	15.0 %	88.0 %	85.0 %
2	11/1/2015	94.7	182.8	14.0 %	6.0 %	86.0 %	94.0 %
3	23/1/2015	205.2	567.9	1.0 %	1.0 %	99.0 %	99.0 %
Spring							

4	6/3/2013	48.9	81.4	6.0%	5.0%	94.0%	95.0%
5	10/3/2013	70.6	117.1	24.0%	22.0%	76.0%	78.0%
6	13/3/2013	59.4	92.7	28.0%	27.0%	72.0%	73.0%
7	23/3/2013	77.7	133.6	15.0%	14.0%	85.0%	86.0%
8	24/3/2013	177.8	243.6	12.0%	7.0%	88.0%	93.0%
9	27/3/2013	191.1	262.6	21.0%	14.0%	79.0%	86.0%
10	5/4/2013	185.7	311.2	6.0%	5.0%	94.0%	95.0%
11	19/4/2013	155.8	288.4	0.0%	1.0%	100.0%	99.0%
12	21/4/2013	59.7	300.3	0.0%	4.0%	100.0%	96.0%
13	1/5/2013	16.7	41.8	1.0%	0.0%	99.0%	100.0%
14	22/5/2013	56.2	150.4	20.0%	7.0%	80.0%	93.0%
15	30/4/2015	208.2	221.7	3.0 %	5.0 %	97.0 %	95.0 %
16	2/5/2015	83.4	151.2	5.0 %	8.0 %	95.0 %	92.0 %
Summer							
17	14/6/2012	11.8	40.1	4.0%	6.0%	96.0%	94.0%
18	16/6/2012	8.3	21.2	7.0%	5.0%	93.0%	95.0%
19	17/6/2012	15.1	79.6	11.0%	23.0%	89.0%	77.0%
20	24/6/2012	14.9	46.3	1.0%	0.0%	99.0%	100.0%
21	27/6/2012	28.8	73.3	1.0%	1.0%	99.0%	99.0%
22	29/6/2012	20.2	78.5	2.0%	6.0%	98.0%	94.0%
23	19/7/2012	12.1	96.1	5.0%	21.0%	95.0%	79.0%
24	31/7/2012	28.3	90.2	1.0%	1.0%	99.0%	99.0%
25	1/8/2012	13.5	35.8	7.0%	3.0%	93.0%	97.0%
26	19/8/2012	28.9	109.6	11.0%	18.0%	89.0%	82.0%
27	20/8/2012	93.5	96.1	53.0%	37.0%	47.0%	63.0%
28	25/8/2012	26.5	74.8	2.0%	6.0%	98.0%	94.0%
29	29/8/2012	172.6	147.0	10.0%	10.0%	90.0%	90.0%
30	30/8/2012	176.7	150.4	12.0%	12.0%	88.0%	88.0%
31	31/8/2012	36.1	120.1	31.0%	42.0%	69.0%	58.0%
32	26/6/2013	11.3	59.2	8.0%	45.0%	92.0%	55.0%

33	23/7/2013	47.3	513.3	23.0%	34.0%	77.0%	66.0%
34	24/7/2013	20.2	290.2	2.0%	2.0%	98.0%	98.0%
35	28/7/2013	32.9	85.3	2.0%	1.0%	98.0%	99.0%
36	30/7/2013	13.7	32.5	3.0%	4.0%	97.0%	96.0%
37	2/8/2013	9.1	20.8	3.0%	3.0%	97.0%	97.0%
38	4/8/2013	10.6	26.9	2.0%	3.0%	98.0%	97.0%
39	6/8/2013	4.7	38.2	9.0%	38.0%	91.0%	62.0%
Autumn							
40	20/9/2012	44.1	119.2	1.0%	1.0%	99.0%	99.0%
41	22/9/2012	22.5	71.5	1.0%	13.0%	99.0%	87.0%
42	3/11/2012	115.3	224.1	2.0%	6.0%	98.0%	94.0%
43	18/10/2013	96.6	96.8	7.0%	7.0%	93.0%	93.0%
44	20/10/2013	40.2	54.4	17.0%	15.0%	83.0%	85.0%
45	8/11/2013	43.4	77.9	17.0%	21.0%	83.0%	79.0%
46	12/9/2014	38.5	108.6	1.0 %	0.0%	99.0 %	100.0 %
47	1/11/2014	251.6	837.1	1.0 %	1.0 %	99.0 %	99.0 %
48	14/11/2014	192.9	274.2	6.0 %	5.0 %	94.0%	95.0 %

Table S5. Seasonal percentage change of the estimated s_{max} (maximum supersaturation in the cloud) and N_d (cloud droplet number concentration) before and after the t_{Nd} , the variance of N_d , the relative contribution of the total aerosol number (N_{total}) and the hygroscopicity (κ) to the droplet number after the t_{Nd} calculated according to the approach described in the main text. Two probability density functions (PDFs) of the characteristic updraft velocity are used with $\sigma_w=0.3 \text{ m s}^{-1}$ and $\sigma_w=0.6 \text{ m s}^{-1}$.

	Winter	Spring	Summer	Autumn
$\sigma_w=0.3 \text{ m s}^{-1}$				
Percentage change of the s_{max} (%)	(-) 9.8	(-) 9.7	(-) 10.0	(-) 10.0

Percentage change of the N_d (cm^{-3})	12.6	12.0	7.0	12.5
Variance of N_d	131	111	32	91
Contribution of κ	9.0	11.0	9.0	6.0
Contribution of N_{total}	91.0	89.0	91.0	94.0
$\sigma_w=0.6 \text{ m s}^{-1}$				
Percentage change of the s_{\max} (%)	(-) 8.9	(-) 7.5	(-) 10.0	(-) 6.3
Percentage change of the N_d (cm^{-3})	16.7	15.3	9.0	15.0
Variance of N_d	299	175	101	205
Contribution of κ	7.0	9.0	14.0	8.0
Contribution of N_{total}	93.0	91.0	86.0	92.0