

Vertical and horizontal variation of aerosol number size distribution in the boreal environment

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Supplementary material

Table S1. The measurement flights done during the campaigns in May–June 2013 and March–April 2014. The days are classified based on the NPF events observed at the Smear II station. NPF event days are marked by ‘E’, and they are additionally divided to class ‘EI’ and ‘EII’ based on whether it was possible to calculate the formation rate and growth rate from the size distribution data, respectively. Class ‘N’ refers to non-event days, and class ‘U’ to undefined days. The case study flights are highlighted.

Flight number	Date	Flight times	Flight around Hyytiälä	Day class	NPF starting time in Hyytiälä
2013_1	24.04.2013	14:26–15:28	-	EII	
2013_2		16:40–17:47	-		
2013_3	29.04.2013	13:19–14:45	-	EII	
2013_4	03.05.2013	08:16–10:42	x	EII	
2013_5	06.05.2013	08:04–10:44	x	EI	11:40
2013_6		16:58–17:56	x		
2013_7	07.05.2013	09:43–12:28	x	EII	11:50
2013_8		15:24–17:56	x		
2013_9	08.05.2013	09:00–12:04	x	EI	09:20
2013_10		14:49–16:59	x		
2013_11	11.05.2013	09:47–12:49	-	EII	13:00
2013_12		15:10–17:12	x		
2013_13	14.05.2013	10:28–12:58	x	EII	
2013_14	15.05.2013	09:27–12:12	x	EI	13:20
2013_15	16.05.2013	08:11–10:52	x	EII	09:00
2013_16		13:53–16:22	x		
2013_17	17.05.2013	09:10–11:45	x	N	

2013_18	18.05.2013	09:10–11:58	x	U	
2013_19	20.05.2013	19:06–21:57	x	U	
2013_20	21.05.2013	09:14–12:02	x	U	
2013_21	22.05.2013	09:30–12:07	x	EII	10:10
2013_22		14:04–16:14	x		
2013_23	23.05.2013	08:15–11:06	x	EII	08:15
2013_24		13:42–16:30	x		
2013_25	25.05.2013	08:43–11:33	x	EII	07:45
2013_26	26.05.2013	06:53–09:52	x	U	
2013_27		12:17–14:46	x		
2013_28	28.05.2013	09:16–11:52	x	N	
2013_29	29.05.2013	10:17–13:17	x	U	
2013_30	31.05.2013	06:49–09:31	-	U	
2013_31	02.06.2013	09:01–10:59	x	U	
2013_32		14:21–16:40	x		
2013_33	03.06.2013	06:40–09:46	x	U	
2013_34		12:04–13:12	x		
2013_35	05.06.2013	14:44–16:11	x	U	
2013_36	06.06.2013	08:02–10:53	-	U	
2013_37		12:52–15:13	x		
2013_38	08.06.2013	07:43–10:41	-	EII	13:30
2013_39		21:04–23:59	-		
2013_40	09.06.2013	11:52–13:52	x	EII	08:50
2013_41	10.05.2013	06:15–09:00	-	U	
2013_42		11:00–13:03	-		
2013_43	13.06.2013	07:50–10:43	x	EII	09:00
2013_44		12:30–14:59	x		
2013_45	15.06.2013	09:25–11:43	x	EI	09:00
2014_1	24.04.2014	17:27–17:59	-	EI	12:30
2014_2	25.03.2014	09:04–11:23	x	EI	14:00
2014_3		14:45–16:51	x		
2014_4	26.03.2014	10:16–12:39	x	EI	11:30
2014_5		15:01–17:24	x		
2014_6	27.03.2014	10:03–12:21	x	EI	09:20
2014_7		15:02–17:09	x		
2014_8	28.03.2014	09:52–12:23	x	EI	10:40
2014_9		14:27–16:30	x		
2014_10	31.03.2014	09:01–11:03	x	EI	12:20
2014_11		12:46–14:42	x		
2014_12	01.04.2014	08:56–10:46	x	EI	15:40
2014_13		12:37–14:33	x		
2014_14	02.04.2014	09:32–11:58	x	EII	09:30

2014_15		14:55–17:21	x		
2014_16	03.04.2014	09:46–11:46	x	EII	10:00
2014_17		13:23–15:41	x		
2014_18	04.04.2014	03:27–05:21	x	EI	10:15
2014_19		09:30–11:39	x		
2014_20	07.04.2014	09:38–11:52	x	U	
2014_21	08.04.2014	10:06–12:26	x	EI	09:20
2014_22		14:47–16:52	x		
2014_23	09.04.2014	09:45–12:02	x	EI	10:30
2014_24		14:29–16:55	x		
2014_25	10.04.2014	07:59–10:24	x	EI	08:00
2014_26		12:26–14:56	x		

Table S2. Class I NPF event days. Comparison of particle concentration and diameter between Hyytiälä station and aircraft-borne measurements inside the PBL. 10th and 90th percentiles (P10 and P90) of the total number concentration (N_{tot}), concentration of particles with diameter 10–25 nm (N_{10-25}) and 80–400 nm (N_{80-400}) are presented. D_p (<25 nm) is the mode peak diameter of sub-25 nm mode when sub-25 nm particles were observed in Hyytiälä.

Flight	Date	N_{tot}		N_{10-25}		N_{80-400}		D_p (<25 nm)	
		Hyytiälä	Cessna	Hyytiälä	Cessna	Hyytiälä	Cessna	Hyytiälä	Cessna
2013_8	8.5.2013	1800–	1600–	300–	400–	200–	100–	4–10	<10–35
		2300	4500	600	1400	200	200		
2013_9	8.5.2013	4200–	5400–	1100–	1300–	300–	300–	>25 nm	>25 nm
		4900	7100	1400	3000	300	300		
2013_15	15.5.2013	1800–	1900–	200–	200–	500–	400–	13–23	<10–42
		2000	2600	300	400	600	700		
2013_45	15.6.2013	2400–	2600–	700–	900–	200–	200–	8–19	<10–22
		4900	9700	2800	4800	300	300		
2014_4	26.3.2014	900–	1400–	300–	300–	0–100	0–100	7–17	<10–30
		1500	3500	400	1000				
2014_5	26.3.2014	3300–	4200–	2000–	3000–	100–	100–	14–16	11–16
		4900	5700	3000	4500	200	100		
2014_6	27.3.2014	2500–	4000–	400–	600–	200–	200–	5–5	<10–39
		4200	6700	500	1400	400	700		
2014_7	27.3.2014	2500–	2500–	400–	600–	300–	200–	7–16	<10–16
		5100	7700	2500	5300	400	400		
2014_8	28.3.2014	900–	1600–	200–	300–	100–	100–	8–14	<10–26
		17300	27500	7800	13500	200	300		
2014_9	28.3.2014	12300–	14600–	5200–	7000–	200–	200–	24–25	11–25
		13300	21300	6700	13400	200	400		
2014_10	31.3.2014	900–	1200–	300–	400–	100–	100–	8–25	11–27
		1200	2800	400	900	100	100		
2014_11	31.3.2014	900–	900–	200–	300–	100–	100–	8–10	<10–26
		1400	2100	300	500	100	100		
2014_19	4.4.2014	1700–	2100–	400–	600–	100–	100–	6–13	<10–29
		2000	3800	600	1200	100	200		
2014_21	8.4.2014	2700–	3400–	1000–	1200–	200–	200–	9–21	<10–22
		8700	8300	4800	6500	300	300		
2014_22	8.4.2014	12200–	8300–	8200–	6200–	200–	100–	13–16	11–16
		13300	14900	9800	15000	200	200		
2014_23	9.4.2014	2400–	3400–	500–	600–	100–	100–	5–8	<10–24
		11600	15000	1900	3300	200	200		
2014_24	9.4.2014	10000–	10900–	5900–	7700–	200–	200–	10–15	<10–16
		12900	16400	6700	15100	200	200		
2014_25	10.4.2014	1800–	2100–	300–	500–	400–	400–	3–14	17–30
		2300	4000	600	1000	400	500		
2014_26	10.4.2014	6600–	11200–	500–	800–	400–	400–	6–8	<10–10
		10000	17400	2000	7500	500	600		