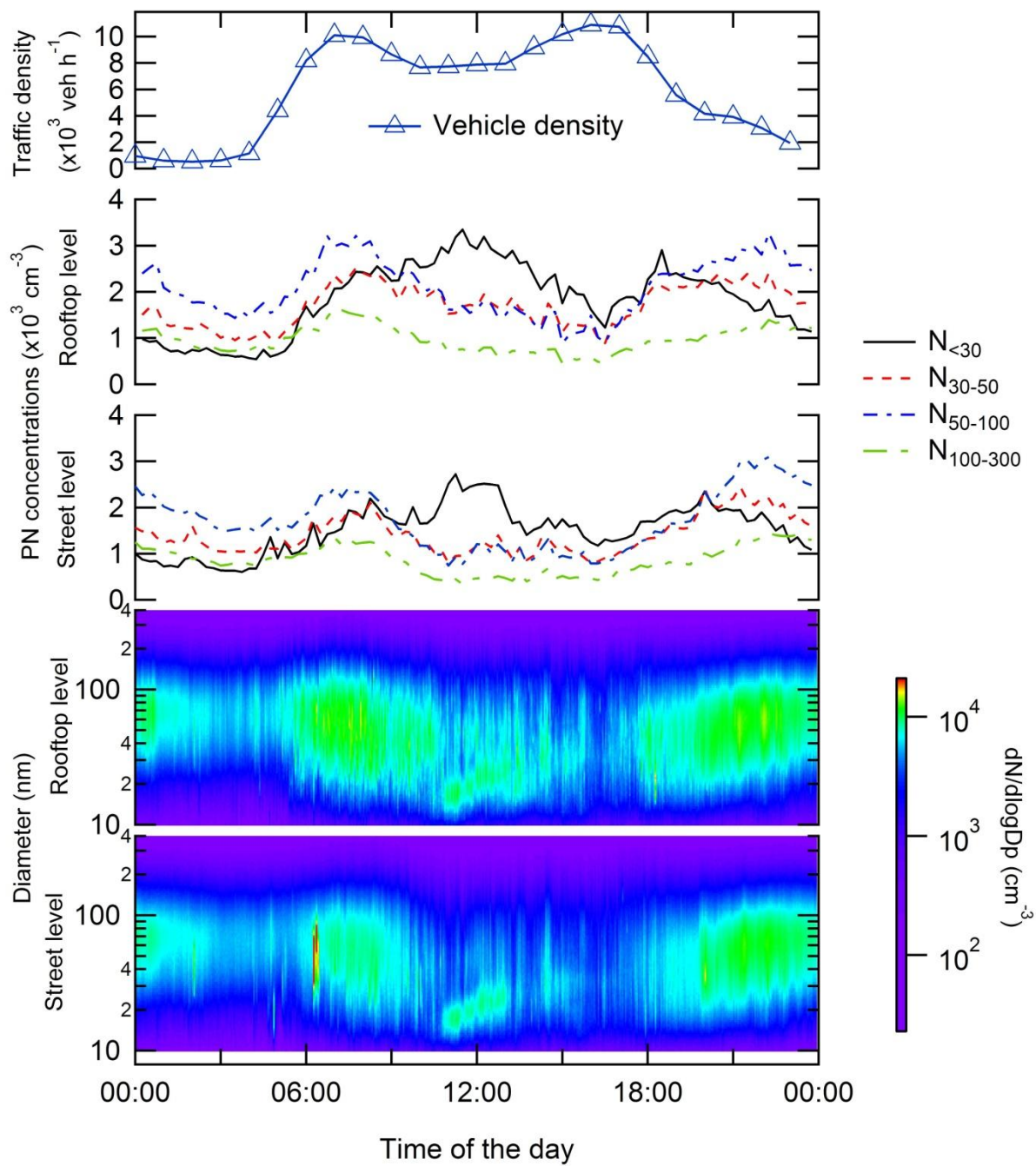
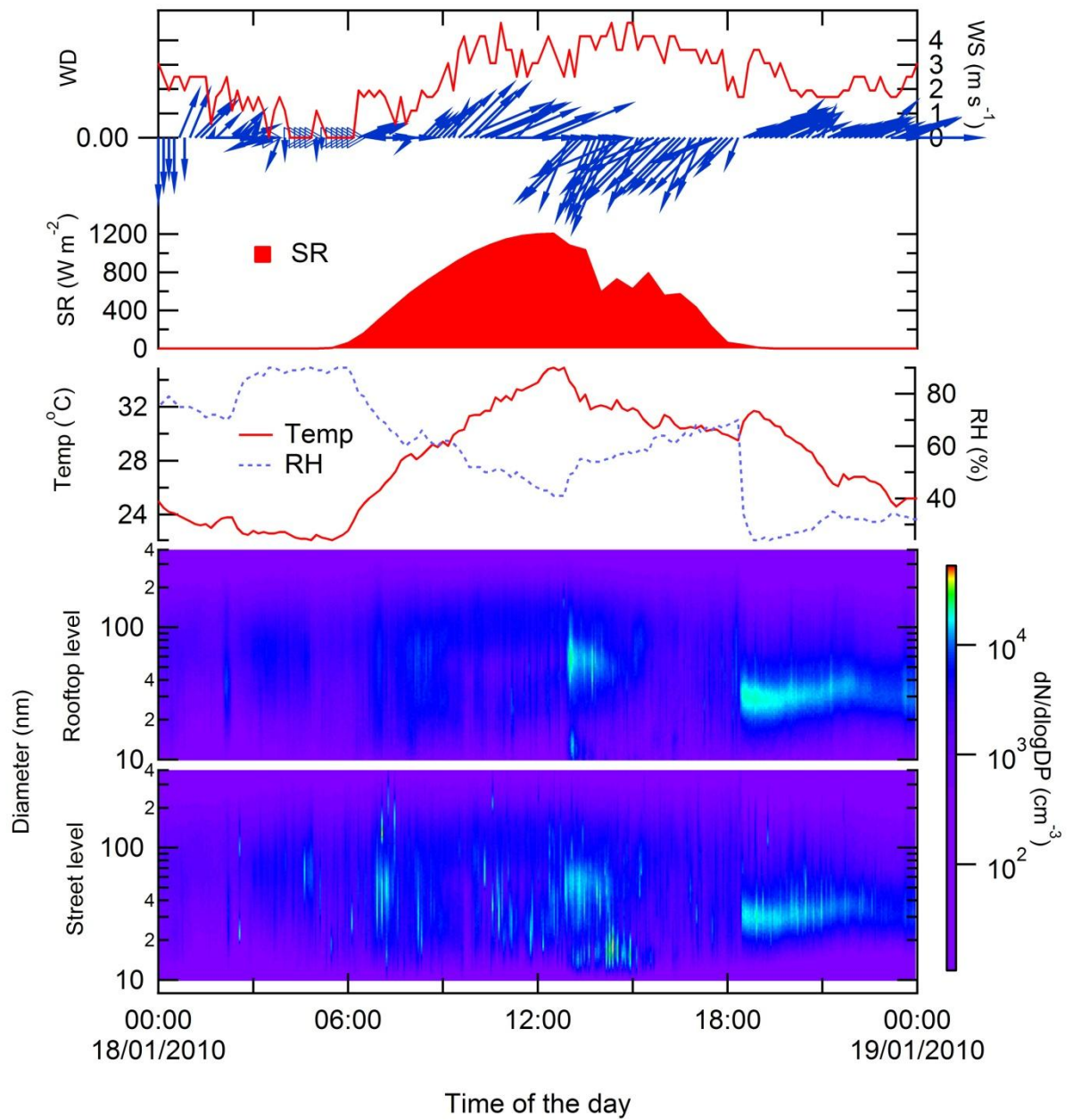


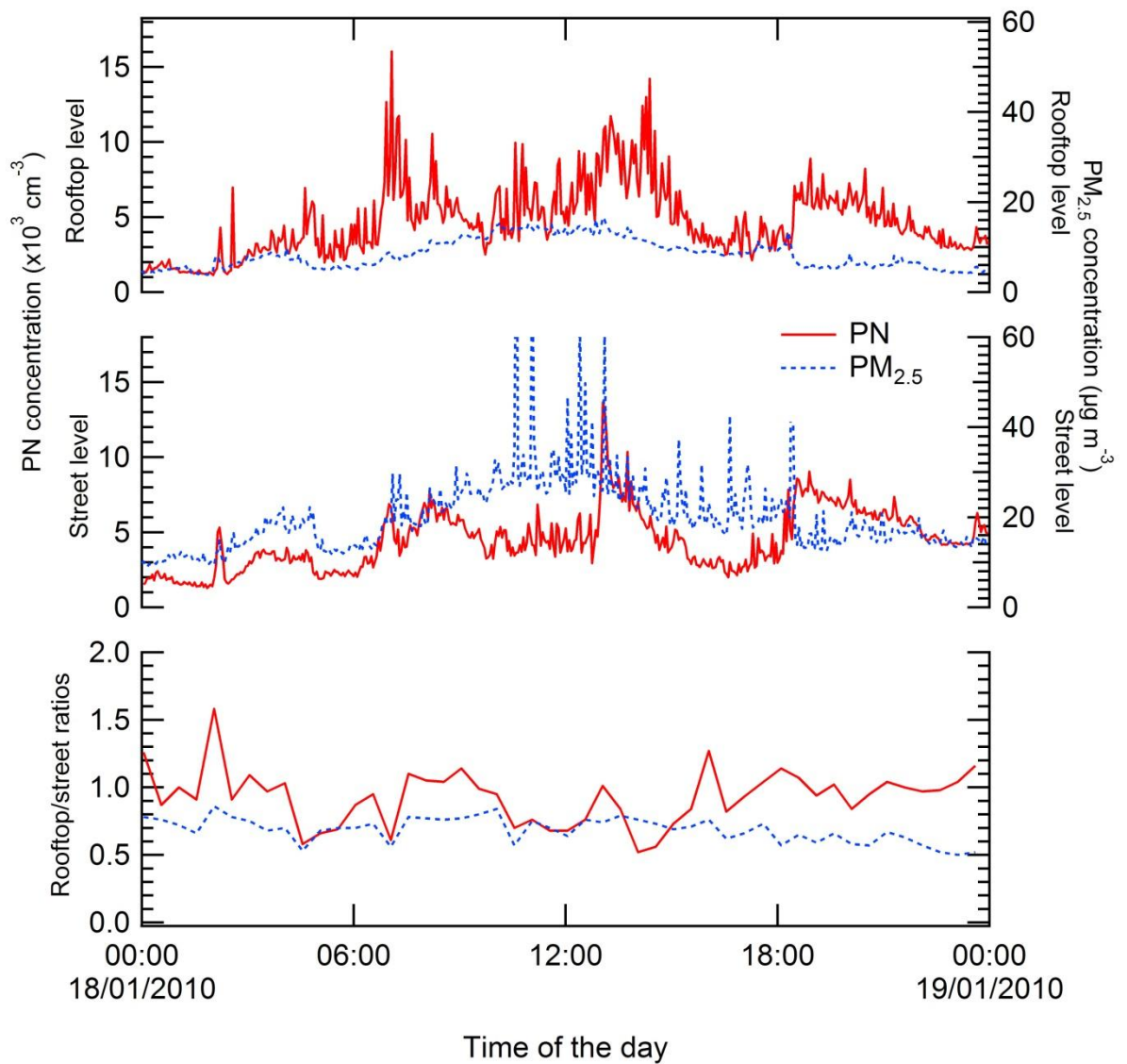
**Fig. S1.** Daily variation of PNSD and PN size fraction concentrations at Building B.



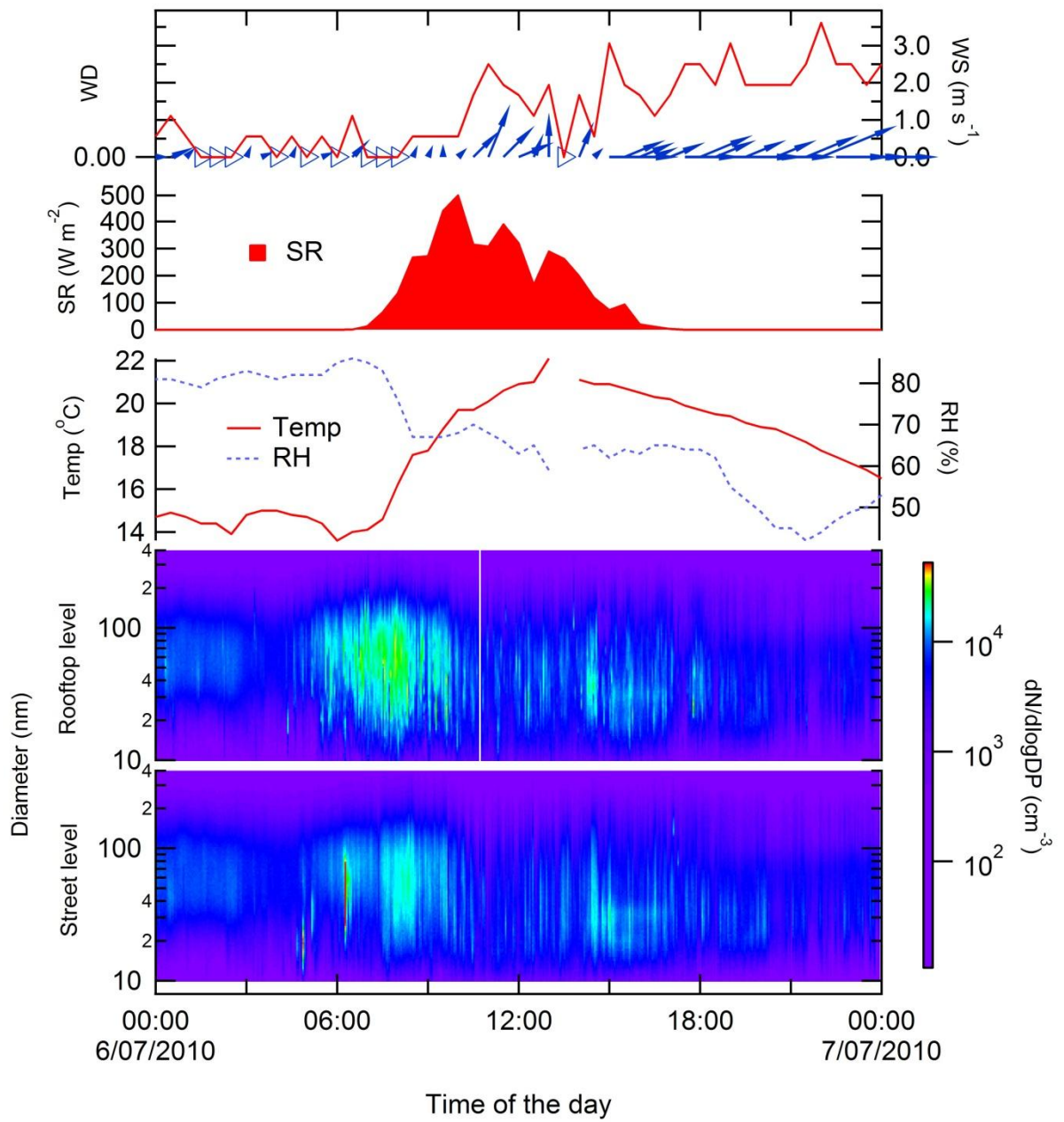
**Fig. S2.** Daily variation of PNSD and PN size fraction concentrations at Building C.



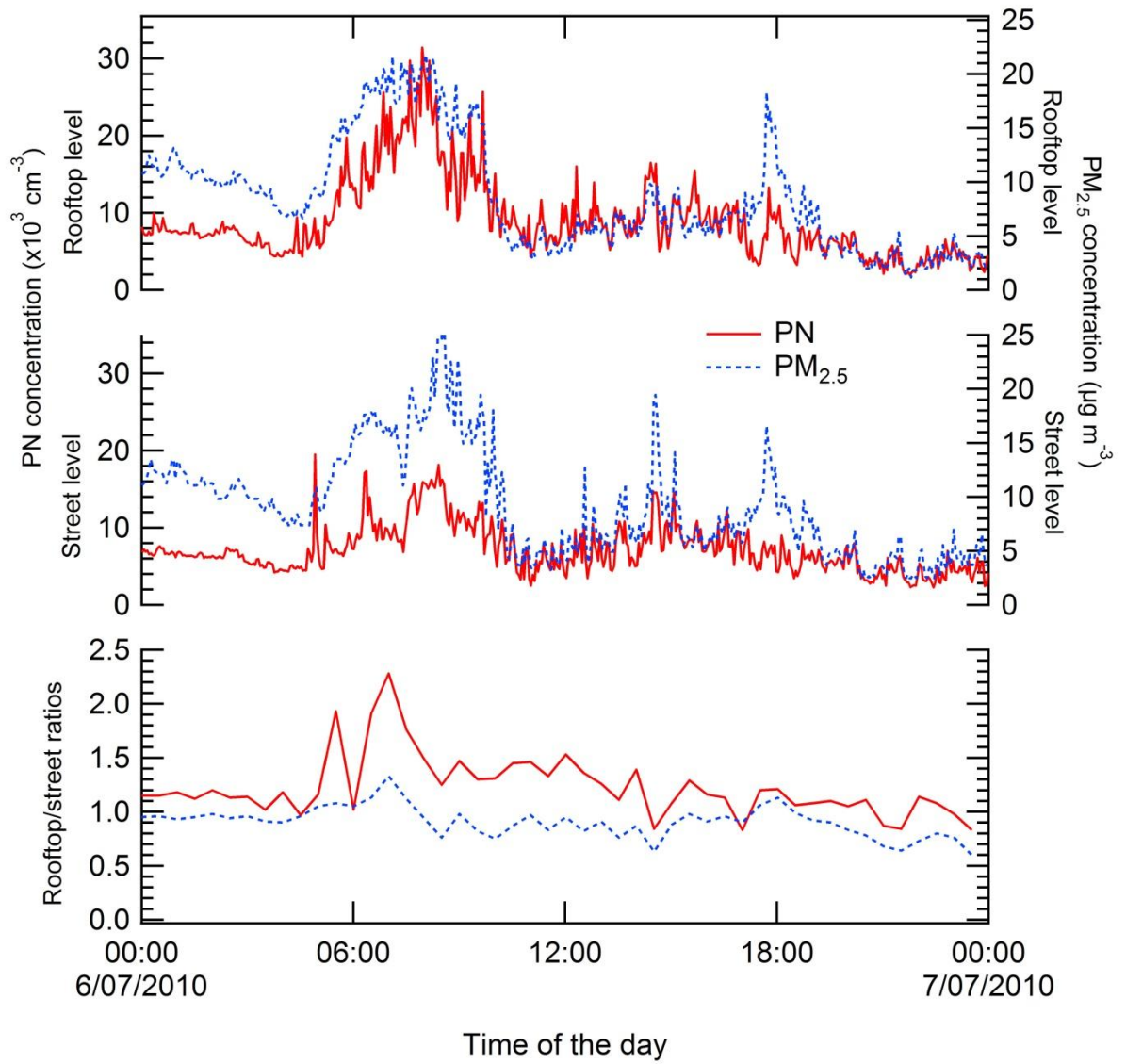
**Fig. S3.** PNSD spectra at Building B on a week day characterised by the non- or unclear nucleation events.



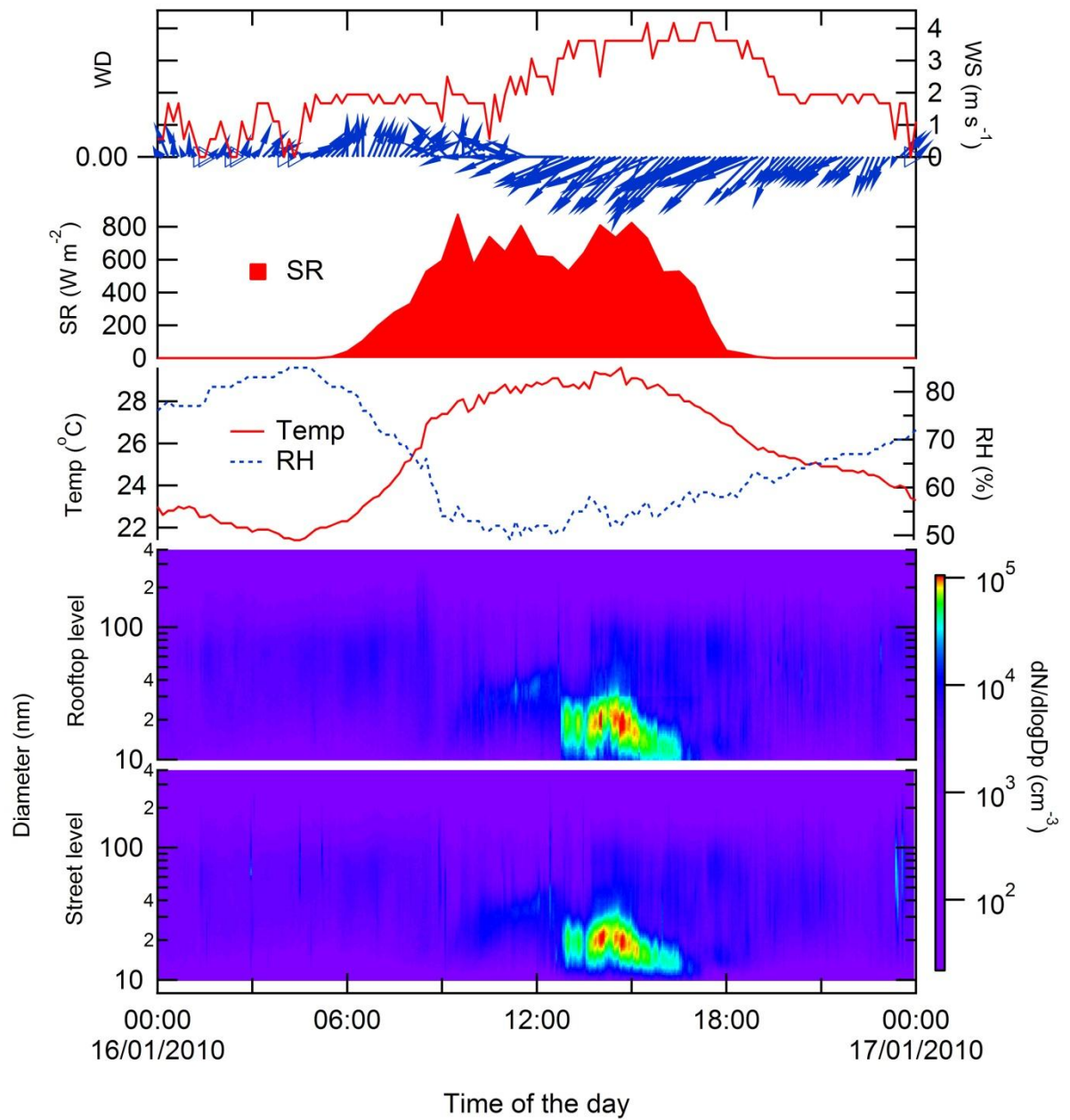
**Fig. S4.** Average particle concentrations and their rooftop to street level ratios at Building B on a weekday characterised by the non- or unclear nucleation events.



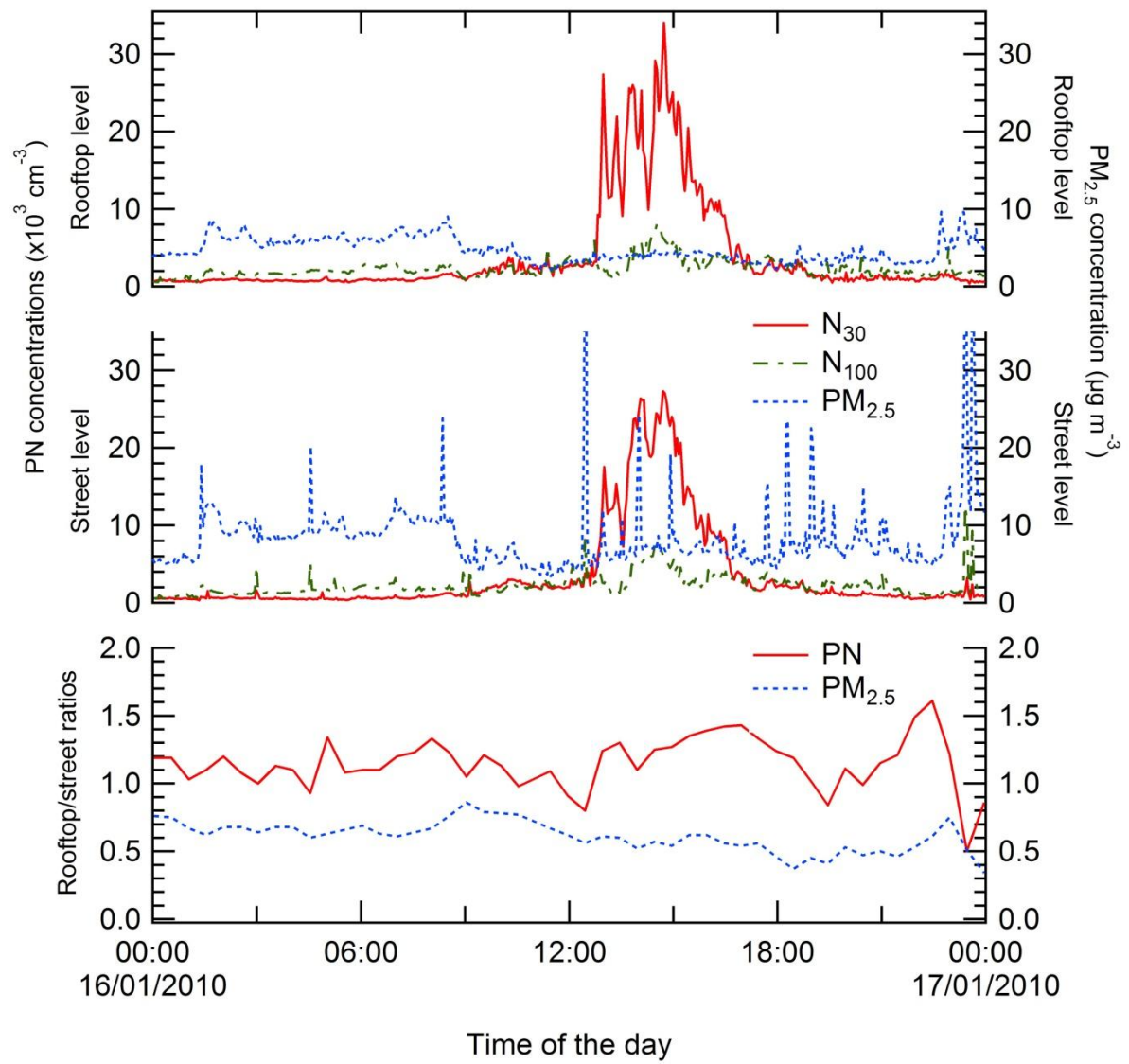
**Fig. S5.** PNSD spectra at Building C on a weekday characterised by the non- or unclear nucleation events.



**Fig. S6.** Average particle concentrations and their rooftop to street level ratios at Building C on a weekday characterised by the non- or unclear nucleation events.

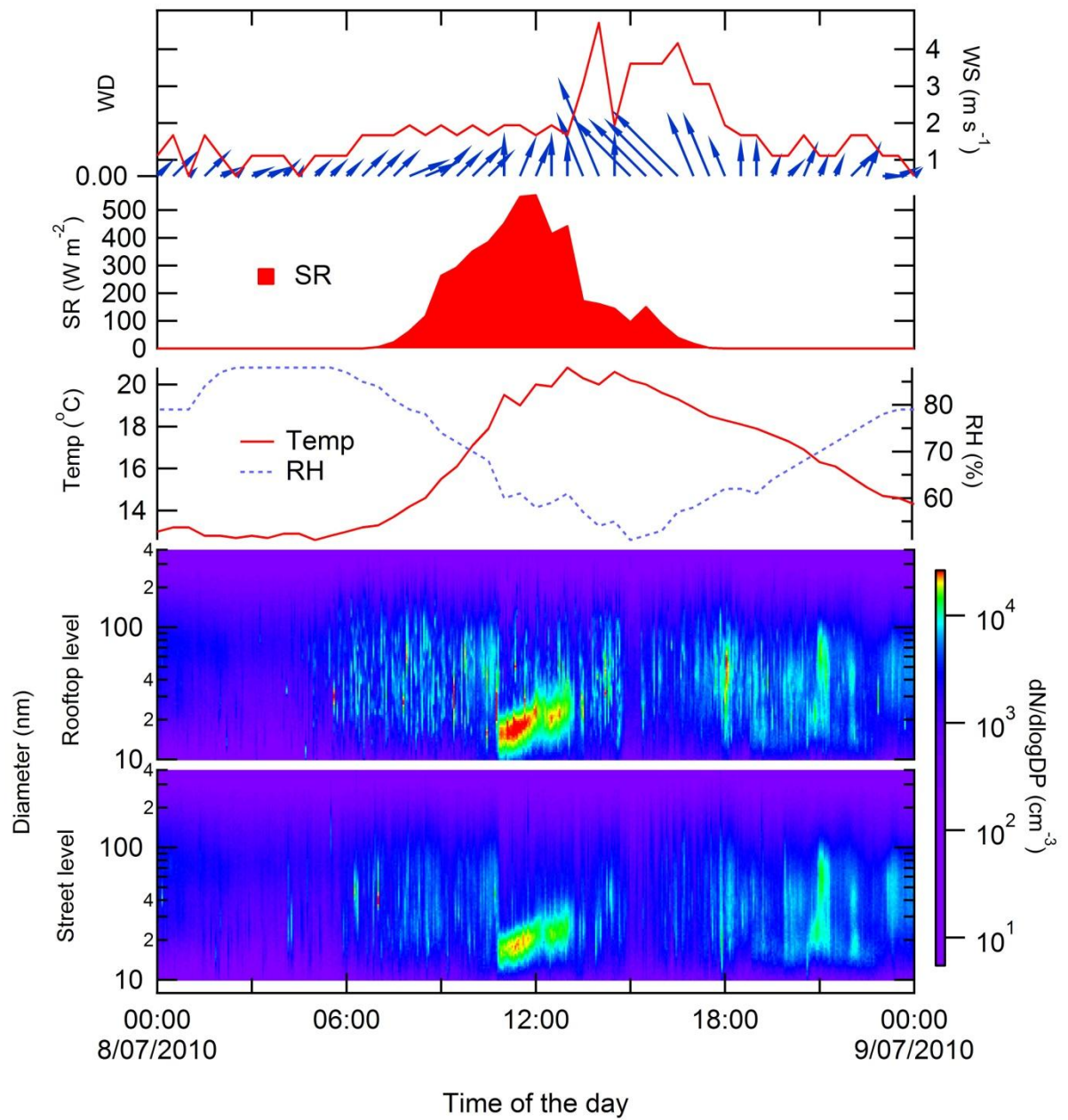


**Fig. S7.** PNSD spectra at Building B on a nucleation event day.

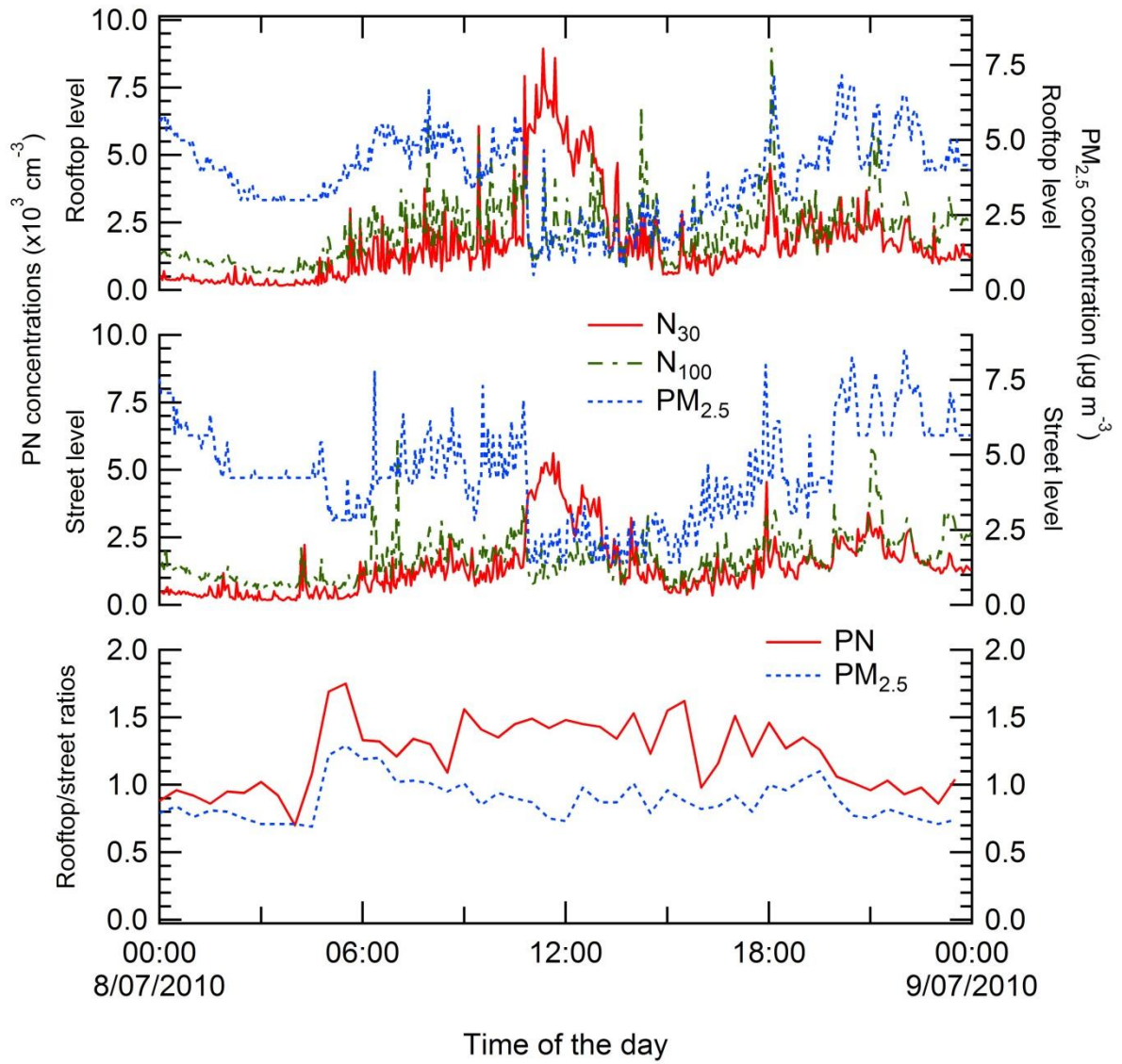


**Fig. S8.** Particle concentrations and their rooftop to street level ratios at Building B on a nucleation event day.





**Fig. S9.** PNSD spectra at Building C on a nucleation event day.



**Fig. S10.** Particle concentrations and their rooftop to street level ratios at Building C on a nucleation event day.

**Table S1.** Summary of conditions during nucleation events\*

Site	Date	Local time	SR W m <sup>-2</sup>	WD	WS M s <sup>-1</sup>	Temp °C	RH %
Building A	25 July 2009	10:45	722	SE	4.17	19.3	46
	31 July 2009	13:45	735	W	3.61	21	32
	1 August 2009	10:45	749	SW	2.5	18.2	47
	2 August 2009	11:30	781	WSW	2.5	19.7	55
	3 August 2009	13:30	738	WNW	4.17	23.2	32
	8 August 2009	13:30	752	E	2.5	22.1	43
	9 August 2009	9:45	656	SW	2.5	15.5	53
Building B	16 January 2010	12:45	614	NE	3.61	28.7	51
	17 January 2010	8:30	709	NNE	2.5	27.4	58
	20 January 2010	12:00	1227	NE	3.06	30.6	34
	21 January 2010	11:15	1193	NE	1.94	31.4	47
	22 January 2010	10:30	410	ENE	1.94	28.2	55
	23 January 2010	14:00	1094	ENE	4.17	31	45
	24 January 2010	14:00	1100	ENE	3.61	31.4	47
	26 January 2010	10:00	1007	N	1.94	30.2	50
27 January 2010	11:00	1116	NE	3.61	32.7	48	
Building C	4 July 2010	9:30	471	SW	1.94	13.4	53
	5 July 2010	12:30	368	SSE	1.67	21.9	49
	8 July 2010	10:45	452	SSW	1.94	19.5	60

\* The data in the table present events observed at the reference sites of Buildings A, B and C.

**Table S2.** Spearman's correlation coefficients ( $\rho$ ) for PNSD and PM<sub>2.5</sub> concentration around the building envelopes

Site	Measured height	Time period	Spearman's correlation coefficient ( $\rho$ )			
			N <sub>&lt;30</sub>	N <sub>30-100</sub>	N <sub>&gt;100</sub>	TNC
Building A	1.5 m	Daily	0.05	0.68**	0.80**	0.63**
		Rush-hours	0.21	0.22	0.78**	0.24
		Nucleation	0.49	0.63*	0.66*	0.48
	6.5 m	Daily	0.04	0.85**	0.94**	0.67**
		Rush-hours	0.46*	0.66**	0.52**	0.56**
		Nucleation	0.26	0.69**	0.71**	0.69**
	10.5 m	Daily	-0.20*	0.72**	0.88**	0.29**
		Rush-hours	0.12	0.77**	0.80**	0.49**
		Nucleation	0.17	0.72**	0.36	0.18
14.5 m	Daily	-0.11	0.84**	0.96**	0.43**	
	Rush-hours	0.27	0.60**	0.67**	0.51**	
	Nucleation	-0.03	0.73**	0.90**	0.39*	
Building B	1.5 m	Daily	0.53**	0.69**	0.82**	0.72**
		Rush-hours	0.13	0.20	0.64**	0.38
		Nucleation	0.66**	0.65**	0.57**	0.65**
	78.5 m	Daily	0.69**	0.82**	0.89**	0.84**
		Rush-hours	0.22	0.35	0.76**	0.43*
		Nucleation	0.78**	0.85**	0.87**	0.87**
Building C	1.5 m	Daily	0.50**	0.40**	0.44**	0.45**
		Rush-hours	0.46*	0.33	0.5*	0.41*
	5.5 m	Daily	0.37*	0.74**	0.75**	0.68**
		Rush-hours	0.55**	0.57**	0.82**	0.61**
	9.5 m	Daily	0.40*	0.85**	0.9**	0.79**
		Rush-hours	0.62**	0.68**	0.68**	0.69**
	21.5 m	Daily	0.56**	0.79**	0.60**	0.74**
		Rush-hours	0.31	0.44*	0.38*	0.46*

\*. Correlation is significant at the 0.05 level (2-tailed)

\*\*. Correlation is significant at the 0.01 level (2-tailed)