1 **Supplementary material**

2

3 Table S1. Lognormal parameterizations of the modeled average particle number size

4 distributions downwind Malmö (Fig. 4a). The parameterization was carried out with the

5 DO-FIT algorithm from Hussein et al. (2005).

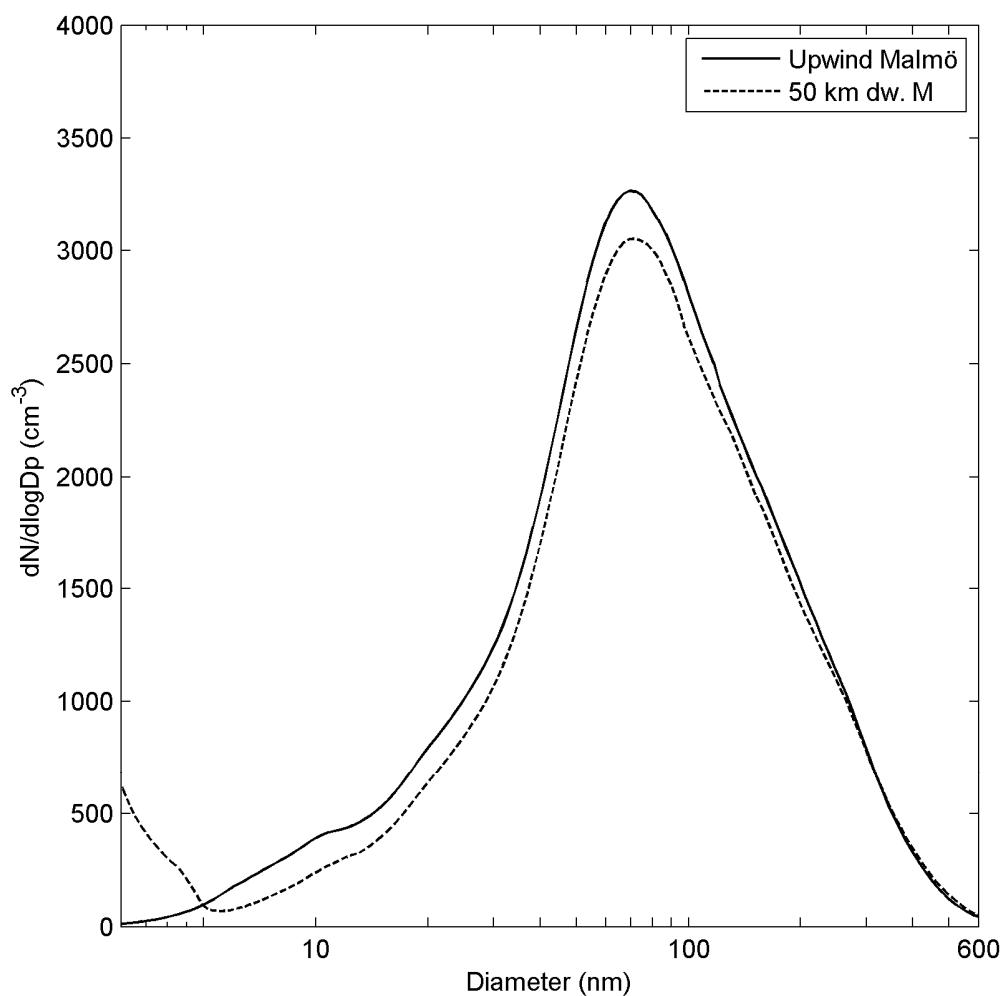| Location	Parameter	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5
	D_p (nm)	7.60	18.8	47.9	106	303
Malmö	σ	1.43	1.32	1.54	1.77	1.32
	PN (cm^{-3})	2237	798.3	2072	2018	88.11
	D_p (nm)	9.98	31.2	76.8	213	-
10 km dw. M	σ	1.43	1.60	1.60	1.52	-
	PN (cm^{-3})	1134	1437	2435	528	-
	D_p (nm)	10.0	25.9	62.6	134.9	346
20 km dw. M	σ	1.35	1.60	1.43	1.683	1.27
	PN (cm^{-3})	512.4	1266	1629	1376	36.87
	D_p (nm)	10.0	25.871	62.6	134.9	346
30 km dw. M	σ	1.35	1.60	1.43	1.68	1.35
	PN (cm^{-3})	301.5	1146	1531	1368	43.2
	D_p (nm)	9.30	26.9	66.2	150.2	327
40 km dw. M	σ	1.18	1.93	1.52	1.68	1.35
	PN (cm^{-3})	1329	47.53	1581	1070	29.66
	D_p (nm)	18.5	31.1	64.7	148.4	309
50 km dw. M	σ	1.66	1.32	1.54	1.66	1.43
	PN (cm^{-3})	212.1	631.9	1895	960.8	92.73

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1   Table S2. Lognormal parameterizations of the modeled median particle number size

2   distributions downwind Malmö (Fig. 4b).). The parameterization was carried out with

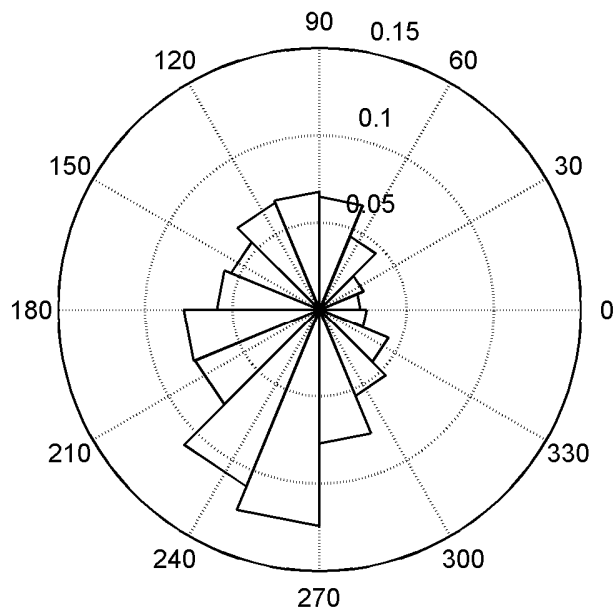3   the DO-FIT algorithm from Hussein et al. (2005).

Location	Parameter	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5
	D_p (nm)	10.4	18.5	55.4	130	286
Malmö	σ	1.32	1.99	1.66	1.66	1.21
	PN (cm^{-3})	143.3	931.5	2294	1052	66.23
	D_p (nm)	11.2	20.4	56.6	127	265
10 km dw. M	σ	1.32	1.88	1.66	1.66	1.32
	PN (cm^{-3})	134.3	644.6	2166.3	993.1	88.57
	D_p (nm)	9.30	21.6	54.2	111.5	265.4
20 km dw. M	σ	1.10	1.77	1.43	1.66	1.43
	PN (cm^{-3})	17.91	858.0	1269	1512	99.29
	D_p (nm)	11.2	35.5	63.3	122	265
30 km dw. M	σ	1.43	1.66	1.43	1.66	1.43
	PN (cm^{-3})	150.5	1098	955.0	1229	113.3
	D_p (nm)	9.30	21.6	51.8	106	303
40 km dw. M	σ	1.43	1.66	1.54	1.77	1.32
	PN (cm^{-3})	25.50	408.1	1245	1584	1584
	D_p (nm)	10.4	24.4	59.9	120	271
50 km dw. M	σ	1.35	1.77	1.68	1.77	1.35
	PN (cm^{-3})	14.81	370.3	1679	1020	107.1

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2   Figure S1. The average background particle number size distribution at Vavihill (50 km

3   downwind Malmö) derived from the modeling of the air mass transport between upwind

4   Malmö and Vavihill (dashed line). The air has not passed Malmö city during this

5   transport. Average upwind Malmö conditions are approximated with Vavihill DMPS size

6   distribution data and denoted with a continuous line.

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2   Figure S2. Wind rose from the meteorological mast in Malmö displaying the wind

3   direction distribution from 2005 to 2009.

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5   **References**

6   Hussein T., Dal Maso M., Petaja T., Koponen I. K., Paatero P., Aalto P. P., Hämeri K.,

7   Kulmala M. Evaluation of an automatic algorith for fitting the particle number size

8   distributions. Boreal Environment Research, 10, 337-355, 2005.