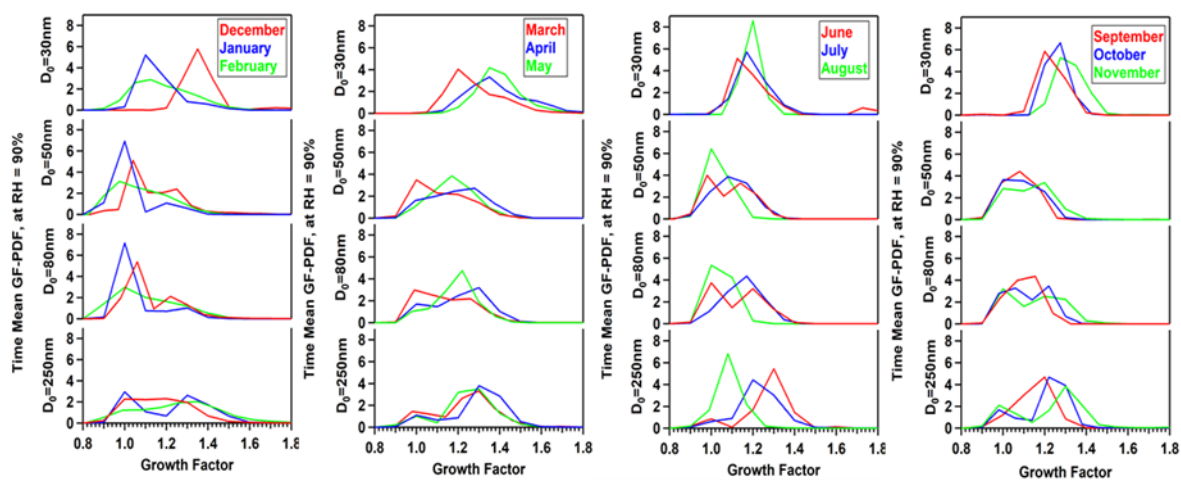


Supplement of Annual Cycle of Hygroscopic Properties and Mixing State of the Suburban Aerosol in Athens, Greece.

C. Spitieri¹, M. Gini¹, M. Gysel-Beer² and K. Eleftheriadis¹

5 Correspondence to: Christina Spitieri (spitieri@ipta.demokritos.gr) and Maria Gini (gini@ipta.demokritos.gr)

Figure S1



10 **Figure S1** Monthly mean GF-PDFs for different dry particle sizes (30, 50, 80 and 250 nm)

Figure S2

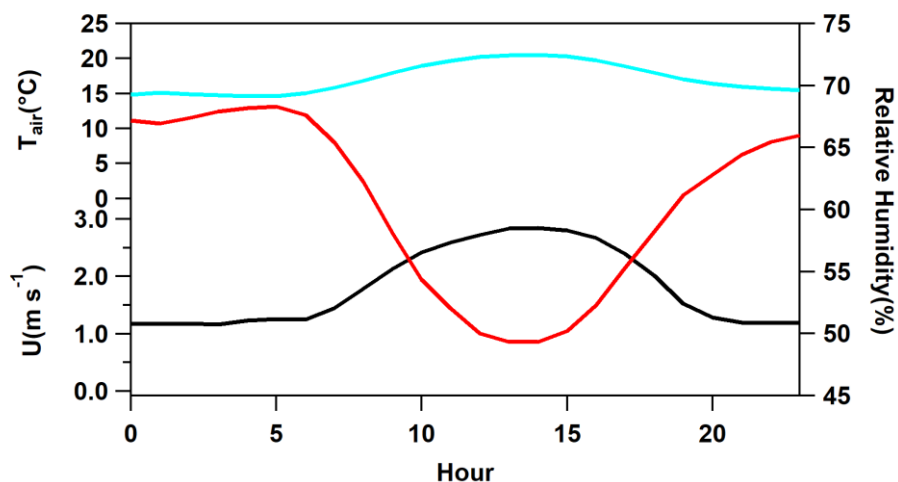


Figure S2 Diurnal variation of wind speed, temperature and relative humidity

- 15 **Table S1** Monthly mean GF at RH=90%, the mean GF for the two distinct GF ranges below/above the threshold GF of 1.12, the hygroscopicity parameter κ mean and the number fraction of each mode, for dry diameters 30, 50, 80 and 250nm.

Month	GF _{mean}	κ _{mean}	GF<1.12	f _{GF<1.12}	GF>1.12	f _{GF>1.12}
<i>Dry diameter of particle, D₀=30nm</i>						
01	1.17	0.07	1.08	0.07	1.22	0.58
02	1.19	0.08	1.05	0.08	1.26	0.60
03	1.29	0.14	1.10	0.08	1.29	0.92
04	1.39	0.19	1.11	0.02	1.38	0.98
05	1.40	0.20	1.12	0.01	1.40	0.99
06	1.23	0.11	1.10	0.02	1.22	0.98
07	1.20	0.08	1.10	0.1	1.19	0.9
08	1.20	0.08	1.11	0.11	1.20	0.89
09	1.25	0.10	1.10	0.05	1.24	0.95
10	1.27	0.11	1.11	0.01	1.26	0.99
11	1.32	0.15	1.10	0.01	1.32	0.99
12	1.41	0.22	1.10	0.01	1.40	0.99
<i>Dry diameter of particle, D₀=50nm</i>						
01	1.03	0.01	1.00	0.83	1.23	0.17
02	1.08	0.03	1.00	0.65	1.22	0.35

03	1.13	0.06	1.03	0.54	1.22	0.46
04	1.19	0.09	1.04	0.32	1.26	0.68
05	1.18	0.08	1.06	0.33	1.22	0.67
06	1.09	0.04	1.02	0.61	1.18	0.39
07	1.10	0.04	1.04	0.59	1.18	0.41
08	1.03	0.01	1.03	0.90	1.14	0.10
09	1.09	0.03	1.04	0.70	1.16	0.30
10	1.09	0.04	1.04	0.63	1.18	0.37
11	1.13	0.05	1.03	0.49	1.21	0.51
12	1.15	0.06	1.05	0.53	1.24	0.47
<i>Dry diameter of particle, D₀=80nm</i>						
01	1.06	0.02	1.00	0.79	1.25	0.21
02	1.11	0.04	1.00	0.59	1.25	0.41
03	1.15	0.06	1.03	0.49	1.20	0.51
04	1.21	0.09	1.04	0.29	1.27	0.71
05	1.19	0.08	1.04	0.26	1.23	0.74
06	1.22	0.05	1.03	0.50	1.22	0.50
07	1.15	0.06	1.05	0.39	1.20	0.61
08	1.05	0.02	1.05	0.90	1.14	0.10
09	1.10	0.04	1.05	0.60	1.17	0.40
10	1.12	0.04	1.03	0.54	1.21	0.46
11	1.15	0.06	1.02	0.45	1.24	0.55
12	1.13	0.05	1.04	0.61	1.24	0.39
<i>Dry diameter of particle, D₀=250nm</i>						
01	1.22	0.09	1.02	0.38	1.33	0.62
02	1.26	0.11	1.01	0.31	1.33	0.69
03	1.24	0.11	1.02	0.25	1.30	0.75
04	1.29	0.13	1.02	0.18	1.33	0.82
05	1.24	0.10	1.02	0.16	1.29	0.84
06	1.27	0.12	1.01	0.12	1.30	0.88
07	1.23	0.10	1.04	0.15	1.25	0.85
08	1.09	0.03	1.05	0.73	1.17	0.27

09	1.15	0.06	1.04	0.37	1.20	0.63
10	1.20	0.09	1.01	0.23	1.26	0.77
11	1.23	0.11	1.01	0.30	1.31	0.70
12	1.17	1.03	1.26	0.08	0.42	0.58

20 **Table S2** Hygroscopic characteristics of atmospheric aerosol per cluster and season

Cluster	GF ₃₀ *	GF _{50_1}	NF ₁	GF _{50_2}	NF ₂	GF _{80_1}	NF ₁	GF _{80_2}	NF ₂	GF _{250_1}	NF ₁	GF _{250_2}	NF ₂	%
1	1.37	1.04	0.46	1.23	0.53	1.03	0.46	1.24	0.52	1.01	0.35	1.29	0.64	4.2
2	1.28	1.03	0.57	1.21	0.43	1.04	0.48	1.22	0.52	1.02	0.31	1.27	0.68	12.1
3	1.35	1.05	0.39	1.23	0.61	1.05	0.37	1.25	0.63	1.02	0.28	1.32	0.70	1.3
4	1.26	1.04	0.57	1.19	0.43	1.04	0.48	1.21	0.52	1.04	0.29	1.25	0.70	67.0
5	1.29	1.03	0.58	1.21	0.42	1.03	0.51	1.22	0.49	1.01	0.30	1.28	0.69	15.3

*Average GF for internally mixed aerosol. Externally mixed aerosol represents 5%, 8%, 0%, 3% and 4% of cluster 1, 2, 3, 4 and 5, respectively.

Table S3 Modal analysis of the average particle number size distributions per cluster

25

	σ_1	NMD ₁	NC ₁	σ_2	NMD ₂	NC ₂	σ_3	NMD ₃	NC ₃	σ_4	NMD ₄	NC ₄
Cluster 1	2.5	6.1	16403	1.6	28.2	8293	1.9	76.1	6275			
Cluster 2	2.4	5.0	5183				2.1	56.6	11138			
Cluster 3	1.5	6.3	38886	1.6	16.0	16046	2.2	54.2	7966			
Cluster 4	2.5	7.1	2330				2.2	61.4	3303	1.4	174.9	392
Cluster 5	1.4	6.9	2904	2.2	13.6	8570	2.1	70.9	4072			