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Supplement of

Aerosol seasonal variations over urban–industrial regions in Ukraine according to AERONET and POLDER measurements

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Supplementary Material

Aerosol seasonal variations over urban/industrial regions in Ukraine according to AERONET and POLDER measurements by Milinevsky et al.

S1 Ångström exponent differences versus AE seasonal scatter plots

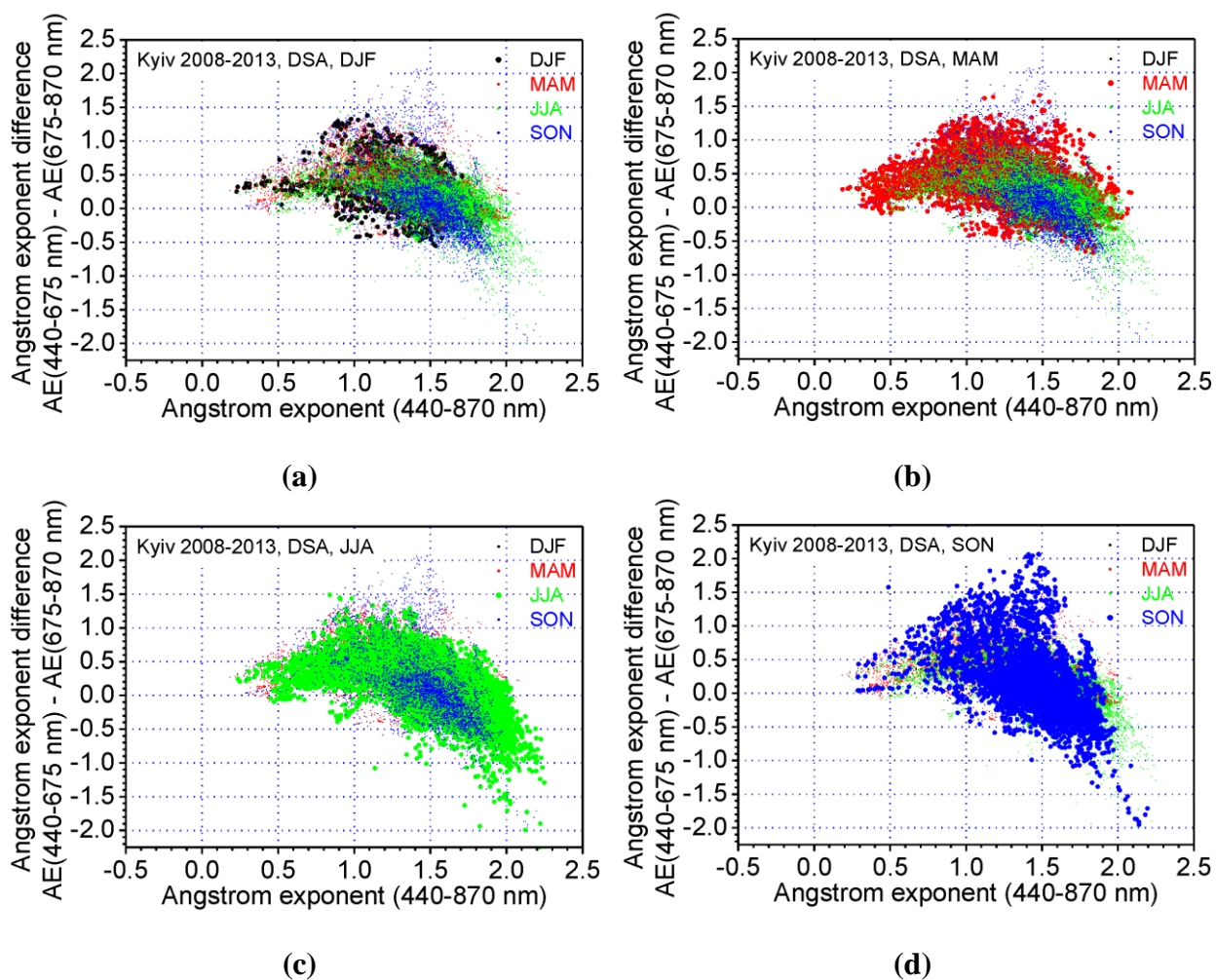


Fig. S1. Scatter plots of the Ångström exponent (AE) difference (AE (440–675 nm) – AE (675–870 nm)) versus AE (440–870 nm) divided by seasons. Each season is highlighted by large dot symbols and color. Level 2.0 data from the Kyiv AERONET site.

S2 Ångström exponent versus AOD seasonal scatter plots

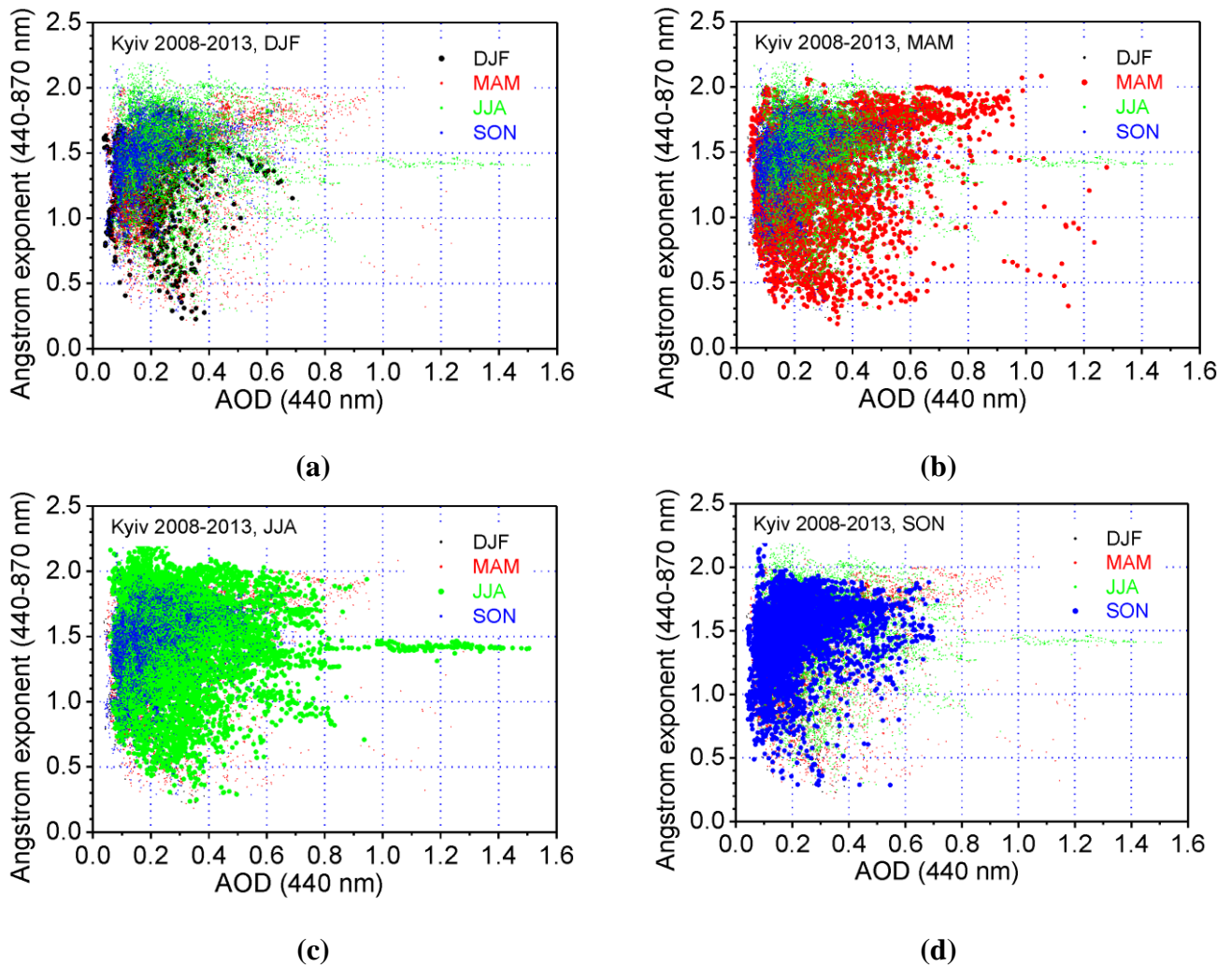


Fig. S2. Scatter plots Ångström exponent (440–870 nm) versus AOD (440 nm) divided by seasons. Each season is highlighted by large dot symbols and color. Level 2.0 data from the Kyiv AERONET site.

S3 Back-trajectories and cluster analysis

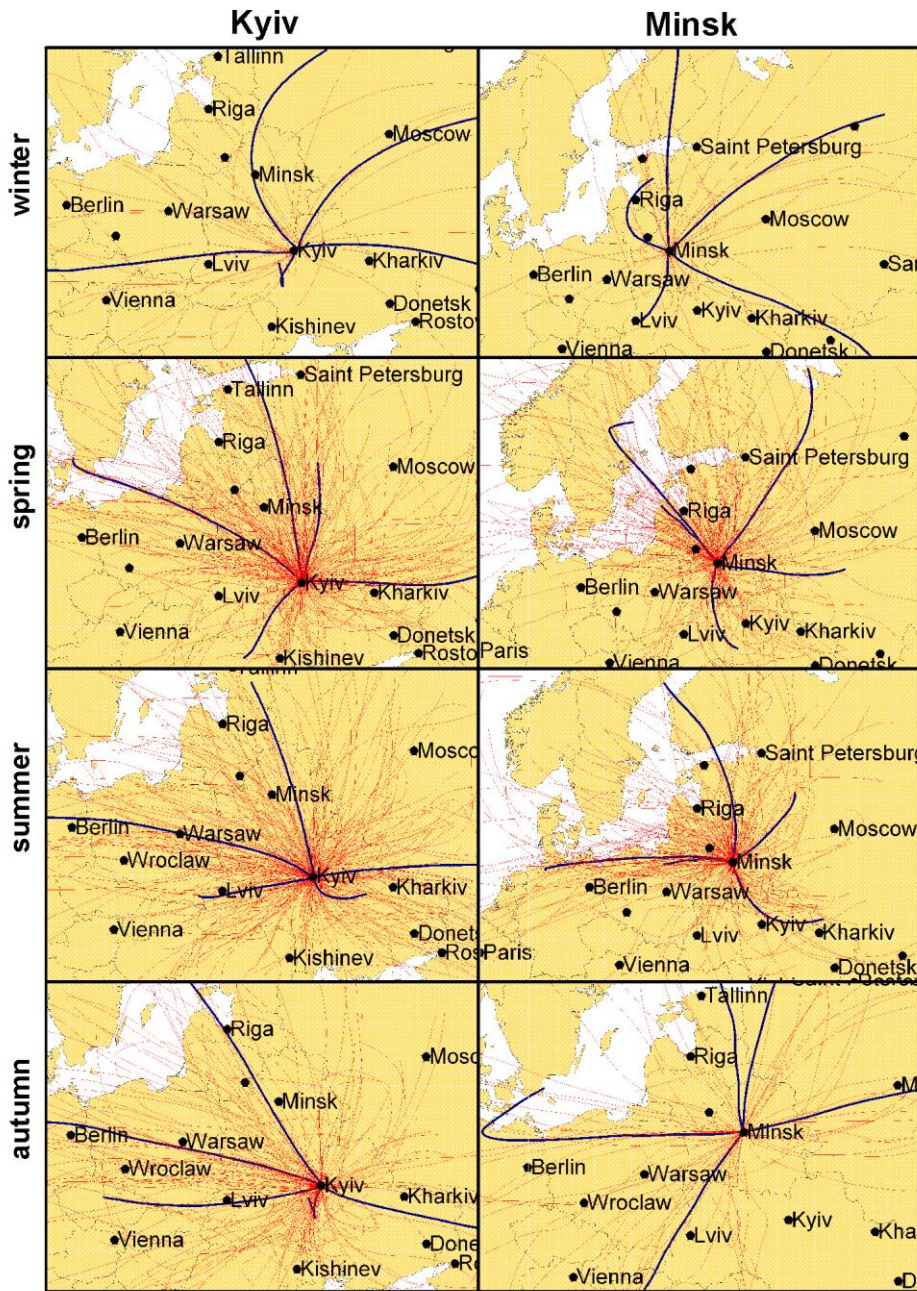


Fig. S3. The 48h back trajectories arrived in the day of measurement at the Kyiv and Minsk AERONET sites (red lines) and the seasonal cluster trajectories (blue bold lines) from five prevailed directions seasonally averaged over the 2008–2013 period.

S4 Summary statistics for aerosol parameters

Table S1. Summary statistics for aerosol parameter variables used for the study retrieved from AERONET (bold) and POLDER data.

Site/Area	Variable	Mean	Median	SD	SE	CV	Range
Kyiv	AOD 440	0.253	0.212	0.157	0.001	62.2	0.038 – 1.505
	AOD 870	0.097	0.079	0.063	0.0004	65.5	0.013 – 0.926
	AOD 865	0.07	0.06	0.05	0.003	73.5	0.01* – 0.4
	AE 440–870	1.422	1.473	0.319	0.002	22.4	0.021 – 2.25
	AE 440–675	1.497	1.547	0.276	0.002	18.5	0.100 – 2.187
	AE 675–870	1.272	1.337	0.502	0.003	39.4	–0.752 – 3.758
	AE 670–865	2.30	2.30	0.27	0.014	9.9	1.81 – 2.97
Minsk	AOD 440	0.233	0.177	0.203	0.0010	87.0	0.022 – 2.838
	AOD 870	0.089	0.068	0.076	0.0004	86.0	0.006 – 1.148
	AOD 865	0.04	0.03	0.05	0.004	113.6	0.01–0.41
	AE 440–870	1.425	1.472	0.325	0.0018	22.8	0.064 – 3.685
	AE 440–675	1.523	1.570	0.295	0.0016	19.3	0.123 – 2.639
	AE 675–870	1.239	1.268	0.533	0.0029	43.0	–0.752 – 8.092
	AE 670–865	2.33	2.30	0.28	0.022	12.1	1.81–2.97
Lugansk	AOD 440	0.224	0.195	0.144	0.0019	64.1	0.0232 – 1.255
	AOD 870	0.090	0.072	0.0632	0.0009	70.3	0.0097 – 0.6416
	AOD 865	0.03	0.02	0.04	0.003	121.0	0.02–0.31
	AE 440–870	1.358	1.419	0.332	0.0045	24.5	0.011 – 2.050
	AE 440–675	1.398	1.442	0.295	0.004	21.1	0.0447 – 2.015
	AE 675–870	1.285	1.363	0.474	0.006	36.9	–0.057 – 2.812
	AE 670–865	2.45	2.30	0.29	0.020	11.8	1.81 – 2.97
Kharkiv	AOD 865	0.05	0.03	0.08	0.006	159.6	0.01 – 0.752
	AE 670–865	2.36	2.30	0.26	0.019	11.0	1.81 – 2.97
Donetsk	AOD 865	0.03	0.02	0.05	0.003	150.0	0.01 – 0.504
	AE 670–865	2.46	2.42	0.29	0.018	11.8	1.81 – 2.97
Dnipropetrovsk	AOD 865	0.05	0.04	0.06	0.004	111.4	0.01 – 0.384
	AE 670–865	2.33	2.30	0.24	0.015	10.4	1.81 – 2.97
Rivne	AOD 865	0.04	0.03	0.04	0.003	106.6	0.01 – 0.368
	AE 670–865	2.38	2.30	0.26	0.018	10.8	1.81 – 2.97
Lviv	AOD 865	0.04	0.03	0.03	0.002	87.9	0.01 – 0.246
	AE 670–865	2.28	2.30	0.21	0.015	9.29	1.81 – 2.91

SD – standard deviation, SE – standard error, CV – coefficient of variation.

*Minimum of range value of the POLDER AOD (865 nm) is chosen as 0.01 taking into account the results of comparison with AERONET data (Bovchaliuk et al., 2013).