

1 **Source apportionment of black carbon aerosols from light**
2 **absorption observation and source-oriented modeling: An**
3 **implication in a coastal city in China**

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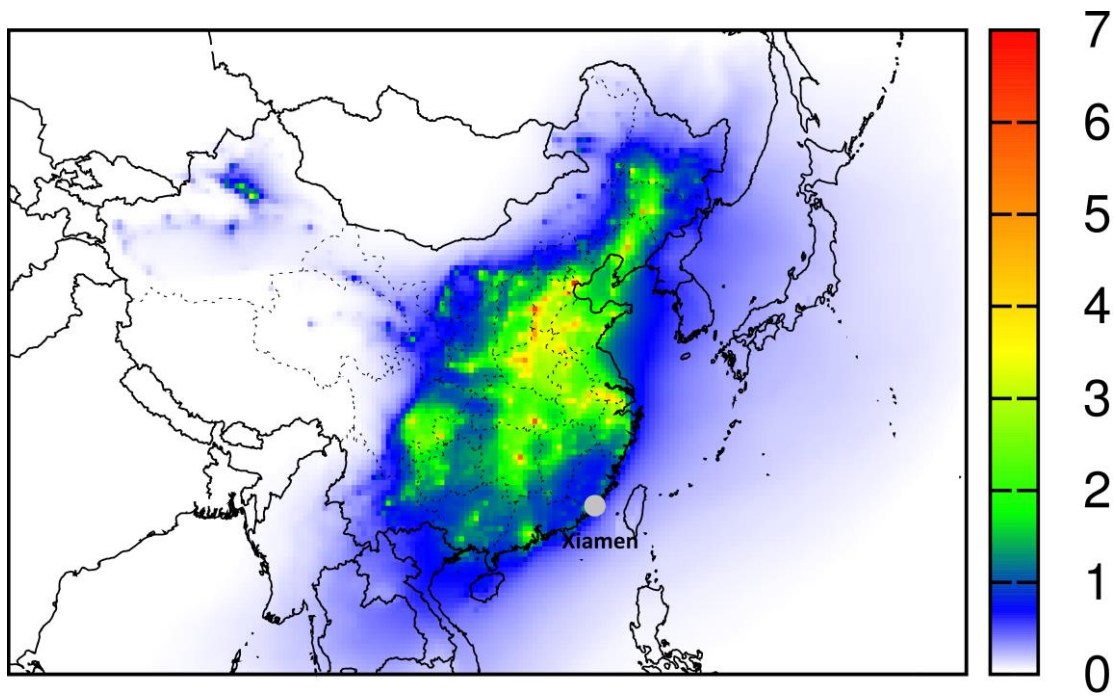
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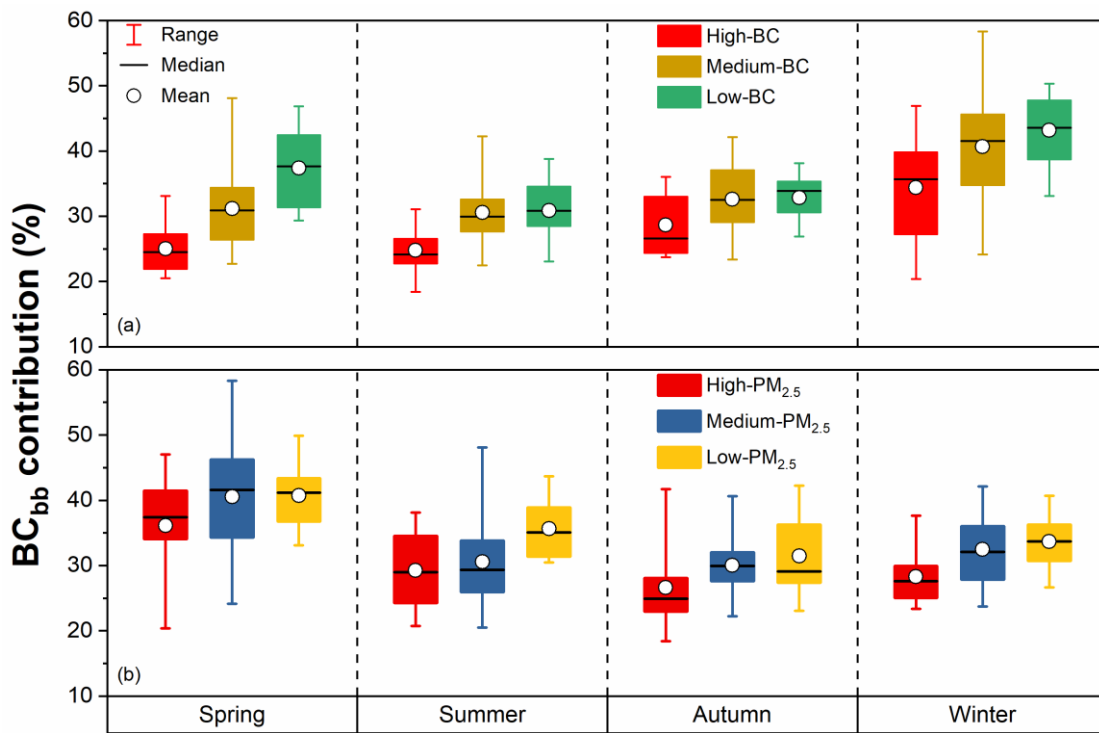
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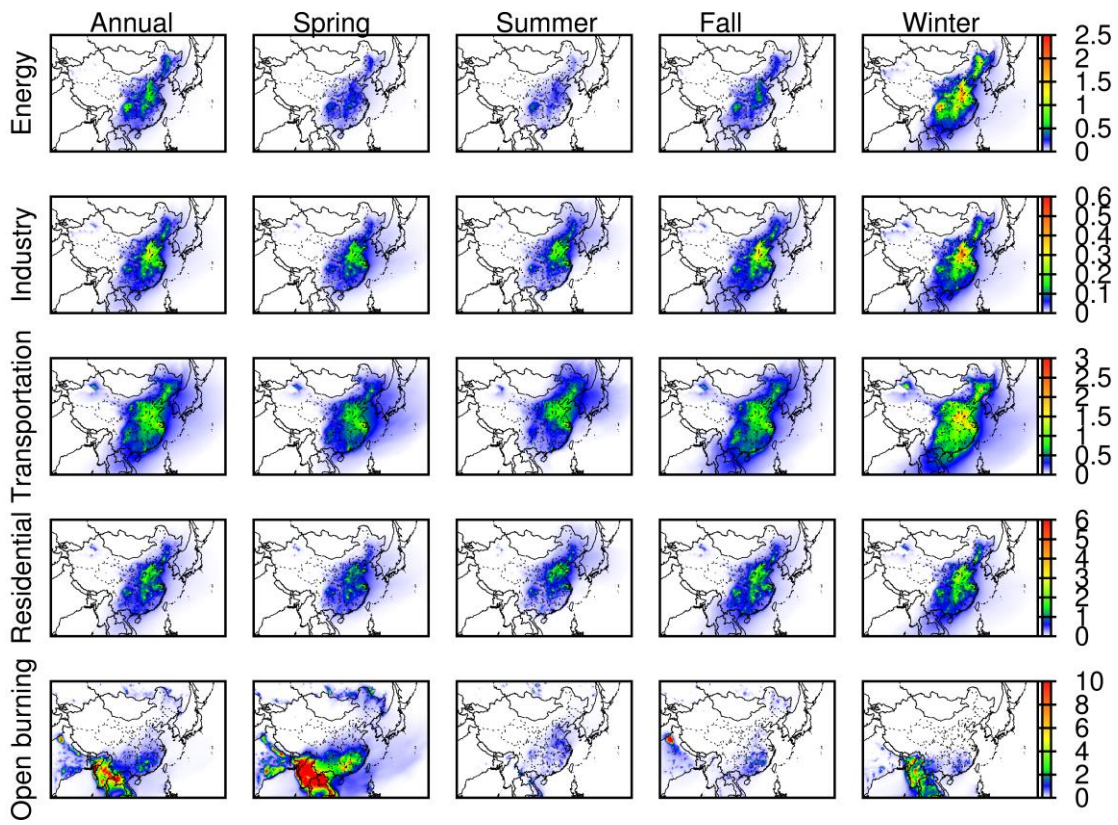
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Figure S1. Spatial distributions of annual average BC concentrations ($\mu\text{g m}^{-3}$) in our domain.



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Figure S2. Box plots of BC_{bb} contribution with different concentrations of (a) BC and (b) $\text{PM}_{2.5}$ in different seasons.



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 17 **Figure S3.** Regional distributions of BC concentrations in five source sectors.
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19 **Table S1.** Relative contributions (%) of fossil fuel (BC_{ff}) and biomass burning (BC_{bb}) to BC derived from the Aethalometer method at different locations.

Location	Study period	Fossil fuel (BC _{ff})	Biomass burning (BC _{bb})	References
Xiamen, China	2014	66.7	33.3	This study
Nanjing, China	2015–2016	81	19	Xiao et al., 2020
Delhi, India	2011.12–2012.03	94	6	Tiwari et al., 2015
Delhi, India	2015.12–2016.02	72	28	Dumka et al., 2018
Ahmedabad, India	2014.01–2015.12	77–84	16–23	Rajesh and Ramachandram, 2017
Gorakhpur, India	2013.08–2015.07	74	26	Vaishya et al., 2017
Chiang Mai, Thailand	2016.03–2016.05	36	64	Pani et al., 2020
Los Angeles, USA	2012–2013, 2016–2017	91	9	Mousavi et al., 2018
Ontario, Canada	2015.06–2016.05	74–88	12–26	Healy et al., 2017
Athens, Greece	2014.12–2015.02	67–71	29–33	Kalogridis et al., 2018
Zurich-Kaserne, Switzerland	2009.04–2010.10	76–90	10–24	Herich et al., 2011
Payerne, Switzerland	2008.03–2010.10	67–94	6–33	Herich et al., 2011
Magadino-Cadenazzo, Switzerland	2008.03–2010.10	70–98	2–30	Herich et al., 2011
Roveredo, Switzerland	2004.12–2005.01	49	51	Sandradewi et al., 2008
Granada, Spain	2014.11–2015.11	53	47	Titos et al., 2017
NAOK, Czech	2013–2017	67.4–74.9	25.6–33.5	Mbengue et al., 2020
London, UK	2009–2011	77–89	11–23	Fuller et al., 2014

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21 **Table S2.** Mean concentrations of BC, BC_{ff}, and BC_{bb} (ng m⁻³) of each cluster in different seasons.

	Cluster	BC	BC _{ff}	BC _{bb}
Spring	C1	4759	3381	1378
	C2	4342	3030	1312
	C3	3620	2229	1391
	C4	5632	4133	1509
Summer	C1	3792	2549	1243
	C2	3832	2680	1152
	C3	3910	2840	1070
	C4	3579	2305	1274
Fall	C1	4848	3412	1436
	C2	4379	2939	1440
	C3	3570	2199	1371
	C4	4050	2779	1280
Winter	C1	4587	2890	1697
	C2	3717	2105	1612
	C3	3779	2361	1418
	C4	4131	2816	1315

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