atmosphere

Supplementary Materials: Spatio-temporal characteristics and variation pattern of the atmospheric particulate matter concentration: A case study of the Beijing–Tianjin–Hebei region, China

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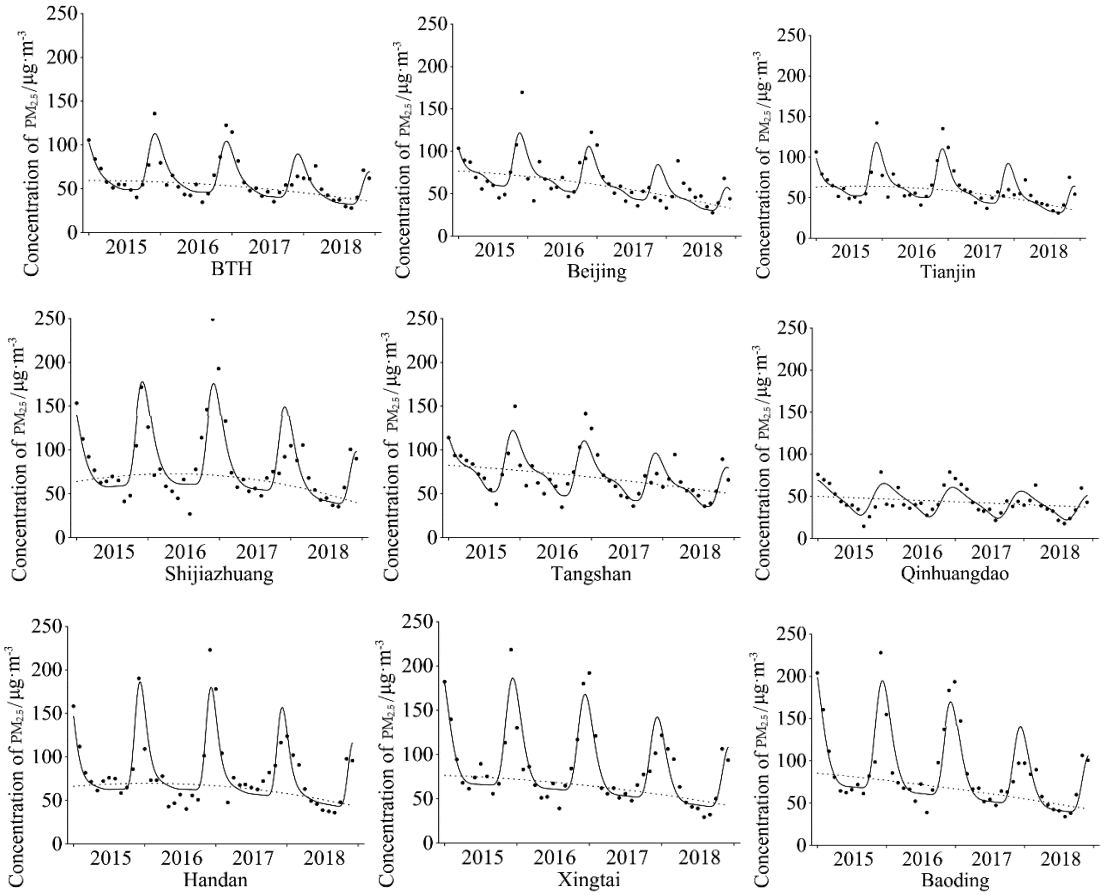
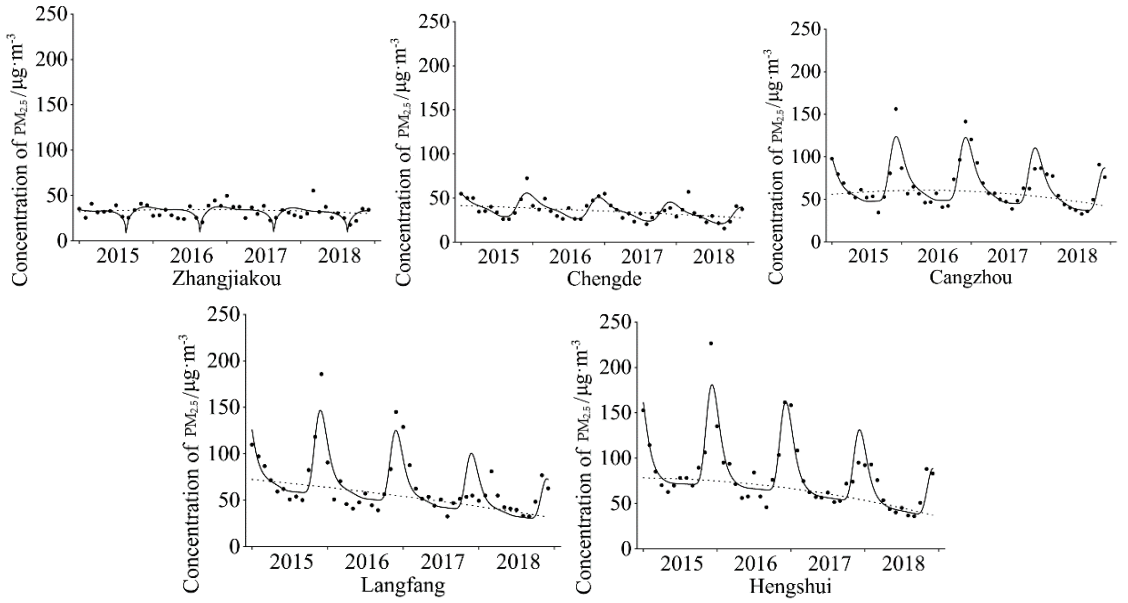
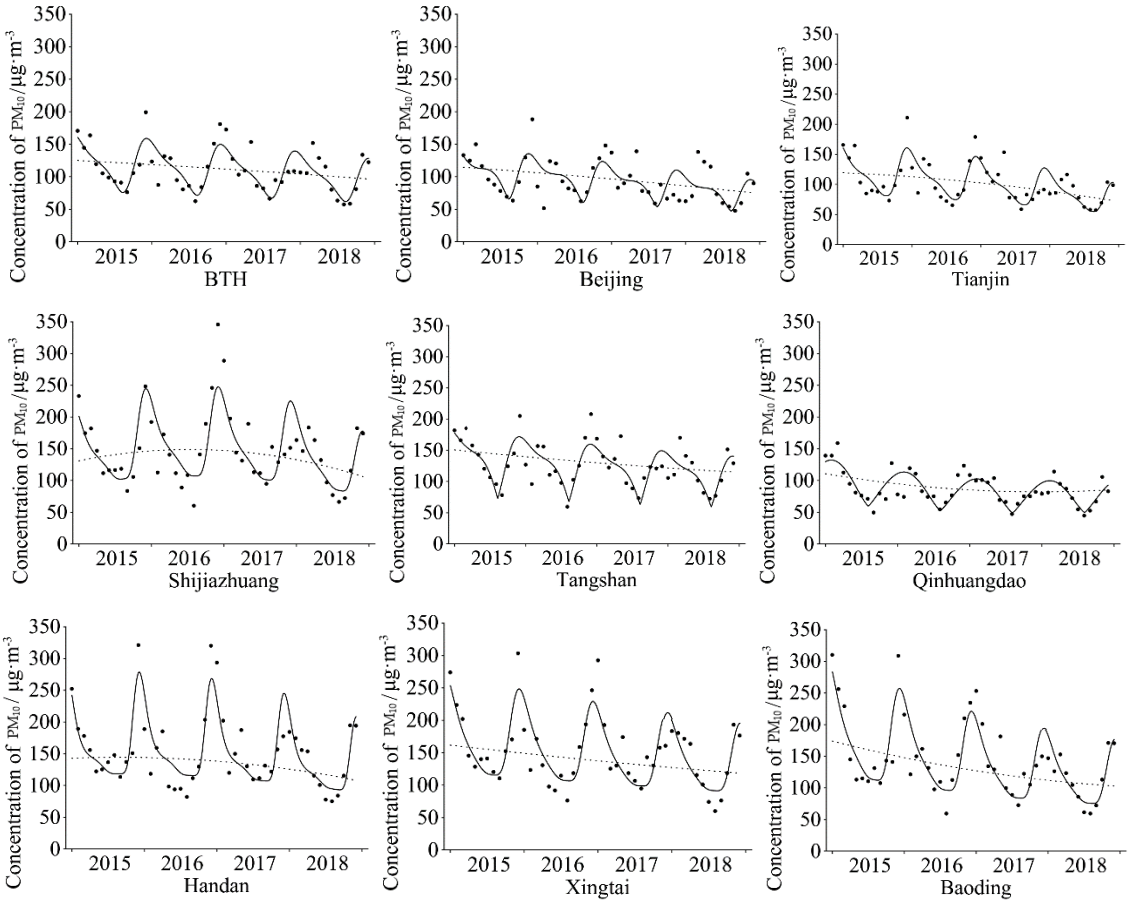
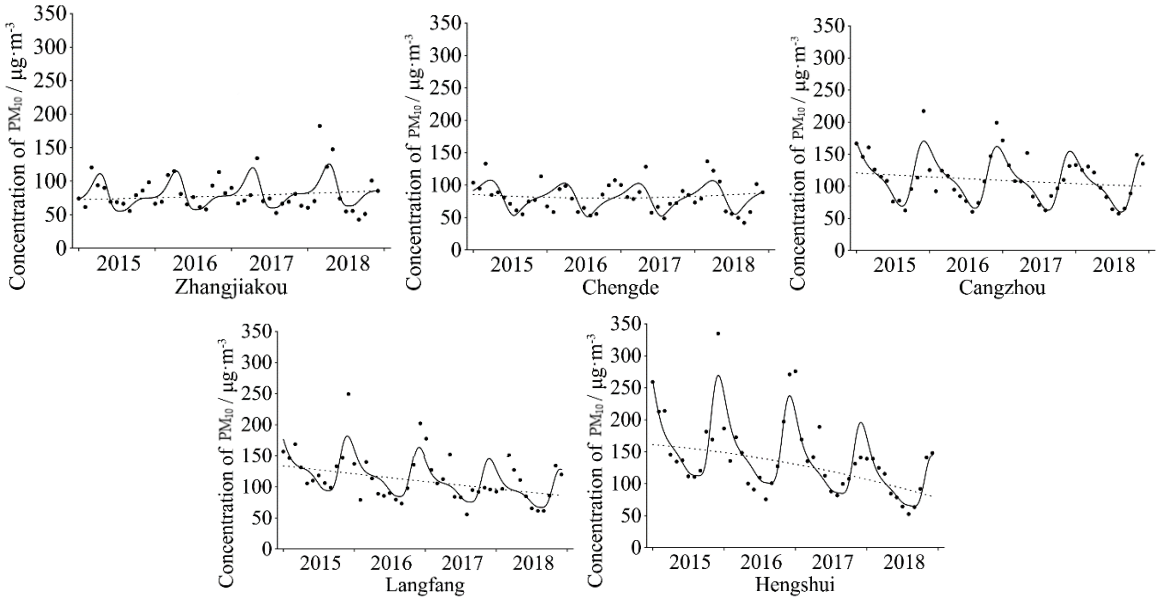



Concentration of $PM_{2.5}$/μg·m^{-3}
0
50
100
150
200
250
2015
2016
2017
2018
Zhangjiakou
Chengde
Cangzhou
Langfang
Hengshui

(**a**)


Concentration of PM_{10}/μg·m^{-3}
0
50
100
150
200
250
300
350
2015
2016
2017
2018
BTH
Beijing
Tianjin
Shijiazhuang
Tangshan
Qinhuangdao
Handan
Xingtai
Baoding



(**b**)

Figure S1. Fitting results of monthly $PM_{2.5}$ (**a**) and PM_{10} (**b**) concentration.

Table S1. Fitting parameters of $PM_{2.5}$ and PM_{10} concentration.

		R^2	mean concentration	A_t	B_t	turning point	Overall trend	Average monthly variation	C_t	D_t	E_t	F_t	G_t	H_t
$PM_{2.5}$	BTH	0.74	59.93	-0.0088	0.01	2014.12	descend rapidly	-0.42	49.56	1.33	12	2.73	1.94	1.14
	Beijing	0.50	64.45	-0.0092	-0.30	before 2015	descend rapidly	-0.76	62.58	1.11	12	2.24	2.08	1.72
	Tianjin	0.67	62.59	-0.0155	0.26	2015.08	rise and then descend	-0.50	51.42	1.26	12	2.49	1.80	1.59
	Shijiazhuang	0.67	83.21	-0.0290	0.99	2016.05	rise and then descend	-0.43	52.84	1.94	12	3.35	2.04	0.89
	Tangshan	0.64	71.34	-0.0034	-0.29	before 2015	descend rapidly	-0.46	55.11	1.39	12	1.45	1.91	1.64
	Qinhuangdao	0.56	43.65	0.0000	-0.16	after 2018	uniform descent	-0.16	29.14	1.41	12	0.94	1.50	1.03
	Handan	0.77	81.71	-0.0198	0.54	2016.01	rise and then descend	-0.43	59.90	1.93	12	4.32	1.69	1.34
	Xingtai	0.81	84.57	-0.0089	-0.20	before 2015	descend rapidly	-0.64	68.07	1.90	12	3.90	2.14	0.59
	Baoding	0.81	87.51	-0.0048	-0.53	before 2015	descend rapidly	-0.77	73.17	1.96	12	3.48	2.08	0.64
	Zhangjiakou	0.18	32.26	-0.0007	0.03	2016.08	rise and then descend	-0.01	3.90	8.00	12	0.15	1.83	1.91
	Chengde	0.59	36.33	-0.0010	-0.16	before 2015	descend rapidly	-0.21	30.49	0.97	12	1.37	1.85	1.38
	Cangzhou	0.76	65.81	-0.0154	0.52	2016.04	rise and then descend	-0.23	44.65	1.55	12	2.69	1.88	1.28
	Langfang	0.67	65.40	-0.0038	-0.56	before 2015	descend rapidly	-0.75	63.65	1.60	12	3.45	1.96	1.45
	Hengshui	0.84	81.42	-0.0157	-0.04	before 2015	descend rapidly	-0.81	72.80	1.59	12	4.39	1.94	0.99
PM_{10}	BTH	0.58	110.82	-0.0015	-0.30	before 2015	descend rapidly	-0.38	78.13	1.14	12	0.92	1.79	1.28
	Beijing	0.32	94.64	-0.0023	-0.39	before 2015	descend rapidly	-0.50	69.11	1.11	12	0.73	2.03	1.89
	Tianjin	0.56	102.97	-0.0085	-0.28	before 2015	descend rapidly	-0.69	84.06	1.02	12	1.26	1.71	1.44
	Shijiazhuang	0.56	148.19	-0.0377	1.46	2016.07	rise and then descend	-0.38	92.88	1.33	12	1.77	1.86	1.28
	Tangshan	0.57	126.68	0.0024	-0.50	after 2018	descend slowly	-0.38	76.68	1.42	12	0.53	1.89	1.41
	Qinhuangdao	0.64	86.75	0.0134	-0.98	2017.12	descend and then rise	-0.32	66.71	1.04	12	0.61	0.82	-0.10
	Handan	0.68	152.86	-0.0194	0.34	2015.08	rise and then descend	-0.61	116.99	1.36	12	2.64	1.63	1.55
	Xingtai	0.68	151.25	0.0029	-0.83	after 2018	descend slowly	-0.69	122.46	1.20	12	1.87	1.92	0.98
	Baoding	0.72	144.34	0.0138	-1.75	after 2018	descend slowly	-1.08	125.92	1.41	12	1.82	1.82	1.06
	Zhangjiakou	0.34	81.62	0.0013	0.14	before 2015	rise rapidly	0.21	54.31	1.02	12	1.62	0.11	-1.91
	Chengde	0.42	81.31	0.0080	-0.36	2016.10	descend and then rise	0.03	55.23	1.00	12	0.83	0.31	-1.34
	Cangzhou	0.71	111.16	0.0012	-0.32	after 2018	descend slowly	-0.26	71.74	1.50	12	1.12	1.75	1.44
	Langfang	0.50	113.81	0.0012	-0.81	after 2018	descend slowly	-0.76	100.79	0.99	12	1.55	1.84	1.72
	Hengshui	0.74	140.82	-0.0142	-0.57	before 2015	descend rapidly	-1.26	118.45	1.46	12	1.99	1.80	1.39