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Supplement of

Spatial and seasonal variations of aerosols over China from two decades of multi-satellite observations – Part 1: ATSR (1995–2011) and MODIS C6.1 (2000–2017)

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Table S1. Annual and seasonal (DJF, MAM, JJA and SON) ADV(A) and MODIS(M) AOD coverage over the years for China, SE China and 10 selected regions.

Annual		region																							
year	China	China		SE		1		2		3		4		5		6		7		8		9		10	
		A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M		
1995	0.92	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.96	x	0.43	x	1	x	
1996	0.92	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.94	x	0.48	x	1	x	
1997	0.93	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.98	x	0.51	x	1	x	
1998	0.93	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.98	x	0.60	x	1	x	
1999	0.96	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.66	x	1	x	
2000	0.93	0.99	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.96	0.98	0.51	1	1	
2001	0.82	0.99	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.86	1	0.17	1	1	
2002	0.97	0.99	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.94	1	0.63	1	1	
2003	1	0.99	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.98	0.77	1	1	1	
2004	0.99	0.99	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.98	0.69	1	1	1	
2005	0.99	0.98	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.98	0.69	1	1	1	
2006	0.99	0.99	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.98	0.71	1	1	1	
2007	1	0.99	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.80	1	1	1	
2008	0.99	0.99	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.98	0.77	1	1	1	
2009	0.98	0.99	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.63	1	1	1	
2010	0.99	0.99	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.71	1	1	1	
2011	0.99	0.99	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.98	0.71	1	1	1	
2012	x	0.98	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.98	x	1	x	1	
2013	x	0.99	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	
2014	x	0.99	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.98	x	1	x	1	
2015	x	0.99	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	
2016	x	0.99	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	
2017	x	0.99	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	
mean	0.96	0.99	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.98	0.99	0.62	1	1	

DJF		region																							
year	China	China		SE		1		2		3		4		5		6		7		8		9		10	
		A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M		
1995	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
1996	0.21	x	0.47	x	0.45	x	0.28	x	0.88	x	0.66	x	0.20	x	0.04	x	1	x	x	x	x	x	x	x	
1997	0.37	x	0.77	x	0.82	x	1	x	1	x	0.91	x	0.58	x	0.40	x	1	x	0.24	x	0.03	x	0.02	x	
1998	0.43	x	0.75	x	0.92	x	0.93	x	0.98	x	0.66	x	0.60	x	0.68	x	1	x	0.26	x	0.06	x	0.26	x	
1999	0.48	x	0.93	x	0.98	x	0.93	x	1	x	1	x	0.87	x	0.96	x	1	x	0.38	x	0.09	x	0.05	x	
2000	0.36	x	0.77	0	0.74	x	0.93	x	1	x	0.97	x	0.58	x	0.72	x	1	x	0.14	x	x	x	x	x	
2001	0.24	0.71	0.5	0.98	0.39	1	0.93	1	1	1	0.66	1	0.09	1	0.28	0.92	1	1	0.10	0.84	x	0.94	x	0.17	
2002	0.26	0.73	0.51	0.95	0.57	1	0.21	1	0.81	1	0.46	1	0.40	1	0.12	0.52	0.85	1	0.06	0.72	x	0.94	0.15	0.71	
2003	0.34	0.71	0.66	0.99	0.41	1	1	1	1	1	0.66	1	0.29	1	0.80	1	1	1	0.08	0.70	0.03	0.83	0.05	0.59	
2004	0.42	0.7	0.87	0.98	0.84	1	1	1	0.98	1	0.97	1	0.71	1	0.76	0.92	1	1	0.20	0.80	0.09	0.91	0.02	0.38	

2005	0.27	0.66	0.55	0.94	0.49	1	0.86	1	1	1	0.69	1	0.07	1	0.24	0.4	1	1	0.20	0.70	x	0.89	x	0.26
2006	0.35	0.75	0.59	0.94	0.67	1	0.79	1	0.9	1	0.54	1	0.49	1	0.16	0.36	1	1	0.34	0.86	x	0.91	0.14	0.47
2007	0.41	0.7	0.8	0.98	0.92	1	1	1	1	1	1	1	0.64	1	0.80	1	1	1	0.16	0.78	0.17	0.86	x	0.66
2008	0.36	0.7	0.69	0.92	0.86	1	1	1	0.95	1	0.77	0.89	0.40	1	0.76	0.44	1	1	0.20	0.56	0.11	0.91	0.29	0.76
2009	0.39	0.74	0.72	0.99	0.67	1	1	1	1	1	0.94	1	0.49	1	0.56	0.92	1	1	0.34	0.74	0.09	0.94	x	0.48
2010	0.34	0.68	0.62	0.96	0.35	1	0.86	1	1	1	0.91	0.97	0.47	1	0.28	0.68	1	1	0.24	0.76	0.14	0.91	x	0.26
2011	0.39	0.71	0.78	0.97	0.8	1	1	1	1	1	0.97	1	0.69	1	0.56	0.72	1	1	0.18	0.86	0.06	0.91	0.09	0.21
2012	0.28	0.66	0.49	0.83	0.61	0.94	0.79	1	1	1	0.48	0.74	0.18	1	x	0.16	1	0.96	0.32	0.84	0.06	0.91	x	0.6
2013	x	0.67	x	0.96	x	0.96	x	1	x	1	x	1	x	0.93	x	0.92	x	1	x	0.80	x	0.91	x	0.1
2014	x	0.7	x	0.99	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.68	x	0.91	x	0.45
2015	x	0.73	x	0.97	x	1	x	1	x	1	x	1	x	1	x	0.88	x	1	x	0.84	x	0.91	x	0.36
2016	x	0.71	x	0.97	x	0.94	x	1	x	1	x	1	x	0.93	x	1	x	1	x	0.90	x	0.91	x	0.31
2017	x	0.7	x	0.97	x	0.96	x	1	x	1	x	1	x	1	x	0.68	x	1	x	0.68	x	0.91	x	0.31
mean	0.35	0.7	0.67	0.91	0.68	0.99	0.85	1	0.97	1	0.78	0.98	0.46	0.99	0.51	0.74	0.99	1	0.22	0.77	0.08	0.91	0.12	0.42

MAM

year	region																									
	China		China		SE		1		2		3		4.00		5.00		6.00		7.00		8.00		9.00		10	
	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M
1995	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
1996	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
1997	0.84	x	0.99	x	1	x	1	x	1	x	0.97	x	1	x	1	x	0.96	x	0.86	x	0.37	x	1	x		
1998	0.84	x	0.99	x	1	x	1	x	0.98	x	1	x	1	x	1	x	1	x	0.82	x	0.20	x	1	x		
1999	0.85	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.86	x	0.43	x	1	x		
2000	0.85	0.91	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.76	0.82	0.26	1	1	1		
2001	0.55	0.93	0.82	1	1	1	0.93	1	0.79	1	1	1	1	1	1	0.64	1	0.42	1	0.02	0.86	x	1	0.91	1	
2002	0.63	0.93	0.83	1	1	1	0.79	1	0.74	1	1	1	1	1	1	1	0.23	1	0.36	0.80	0.11	1	1	1	1	
2003	0.92	0.94	0.99	1	1	1	1	1	1	1	1	1	1	1	1	1	0.92	1	0.80	0.86	0.60	1	1	1	1	
2004	0.92	0.95	1	1	1	1	1	1	1	1	1	1	1	1	1	0.96	1	1	1	0.78	0.90	0.54	1	1	1	
2005	0.9	0.9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.96	1	0.78	0.78	0.60	1	1	1	1	
2006	0.9	0.93	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.72	0.80	0.48	1	1	1	1	
2007	0.91	0.95	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.72	0.78	0.57	1	1	1	1	
2008	0.89	0.92	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.76	0.68	0.54	1	1	1	1	
2009	0.92	0.95	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.94	0.88	0.51	1	1	1	1	
2010	0.92	0.95	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.80	0.96	0.48	1	1	1	1	
2011	0.9	0.95	1	1	1	1	1	1	1	1	1	1	1	1	1	0.96	1	1	1	0.78	0.88	0.46	1	1	1	
2012	0.69	0.95	0.96	1	1	1	1	1	0.98	1	1	1	1	1	1	0.60	1	1	1	0.56	0.80	0.28	1	0.66	1	
2013	x	0.94	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.82	x	1	x	1	x	
2014	x	0.93	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.76	x	1	x	1	x	
2015	x	0.93	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.76	x	1	x	1	x	
2016	x	0.94	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.80	x	1	x	1	x	
2017	x	0.91	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.68	x	1	x	1	x	
mean	0.84	0.93	0.97	1	1	1	0.98	1	0.97	1	0.99	1	1	1	0.95	1	0.91	1	0.71	0.81	0.43	1	0.97	1		

JJA

year	region																									
	China		China		SE		1		2		3		4		5		6		7		8		9		10	
	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M
1995	0.84	x	0.93	x	1	x	1	x	0.86	x	1	x	1	x	1	x	1	x	0.46	x	0.90	x	0.26	x	1	x

1996	0.85	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1.00	x	0.84	x	0.46	x	1	x	
1997	0.91	x	1	x	1	x	1	x	0.98	x	1	x	1	x	1	x	1.00	x	0.94	x	0.46	x	1	x	
1998	0.87	x	0.98	x	1	x	1	x	1	x	0.97	x	1	x	1	x	0.88	x	0.84	x	0.57	x	1	x	
1999	0.89	x	0.97	x	1	x	1	x	0.9	x	1	x	1	x	1	x	0.96	x	0.90	x	0.40	x	1	x	
2000	0.87	0.91	0.98	0.99	1	1	1	1	0.98	1	1	1	1	1	1	1	0.92	1	0.92	0.48	0.46	1	1	1	
2001	0.72	0.95	0.92	1	0.98	1	1	1	0.98	1	1	1	1	1	0.84	1	0.77	1	0.62	0.86	0.14	1	0.98	1	
2002	0.93	0.93	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.96	1	0.78	0.74	0.60	1	1	1	
2003	0.96	0.91	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.94	0.72	0.77	1	1	1	
2004	0.96	0.92	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.92	0.84	0.63	1	1	1	
2005	0.96	0.94	1	0.99	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.94	0.82	0.66	1	1	1	
2006	0.97	0.95	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.96	0.80	0.69	1	1	1	
2007	0.98	0.94	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.98	0.84	0.74	1	1	1	
2008	0.96	0.92	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.96	0.74	0.77	1	1	1	
2009	0.95	0.94	1	0.99	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	0.90	0.63	1	1	1	
2010	0.96	0.93	1	0.99	1	1	1	1	1	1	1	1	1	1	1	1	1	0.96	1	0.92	0.80	0.66	1	1	1
2011	0.97	0.96	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	0.90	0.66	1	1	1	
2012	x	0.92	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.66	x	1	x	1	
2013	x	0.96	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.86	x	1	x	1	
2014	x	0.92	x	0.99	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.84	x	1	x	1	
2015	x	0.95	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.80	x	1	x	1	
2016	x	0.94	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.82	x	1	x	1	
2017	x	0.94	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.82	x	1	x	1	
mean	0.91	0.93	0.99	1	1	1	1	1	0.98	1	1	1	1	1	0.99	1	0.94	1	0.90	0.70	0.56	1	1	1	

SON

year	region																									
	China		China		SE		1		2		3		4		5		6		7		8		9		10	
year	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M
1995	0.86	x	0.99	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.96	x	0.86	x	0.31	x	1	x
1996	0.9	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.92	x	0.37	x	1	x
1997	0.87	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.84	x	0.31	x	1	x
1998	0.89	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.90	x	0.31	x	1	x
1999	0.9	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.40	x	1	x	1	x
2000	0.86	0.97	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.92	0.98	0.31	1	1	1
2001	0.69	0.98	0.88	1	0.92	1	0.86	1	0.95	1	0.94	1	0.84	1	0.88	1	1	1	1	0.68	1.00	0.11	1	1	1	
2002	0.92	0.95	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.76	0.78	0.60	1	1	1	
2003	0.96	0.98	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.98	0.98	0.60	1	1	1	
2004	0.94	0.97	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.98	0.51	1	1	1	
2005	0.95	0.98	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.98	0.98	0.54	1	1	1
2006	0.94	0.97	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.96	0.94	0.57	1	1	1
2007	0.96	0.99	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.63	1	1	1
2008	0.94	0.95	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.98	0.66	0.57	1	1	1
2009	0.94	0.97	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.98	0.92	0.54	1	1	1
2010	0.96	0.98	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.96	0.60	1	1	1
2011	0.94	0.97	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.98	0.98	0.63	1	1	1
2012	x	0.98	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.98	x	1	x	1
2013	x	0.94	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.70	x	1	x	1
2014	x	0.96	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.84	x	1	x	1
2015	x	0.99	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1.00	x	1	x	1
2016	x	0.94	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.82	x	1	x	1

2017	x	0.94	x	1	x	1	x	1	x	1	x	1	x	1	x	1	x	0.82	x	1	x	1
mean	0.91	0.93	0.99	1	1	1	1	0.98	1	1	1	1	0.99	1	0.94	1	0.90	0.79	0.56	1	1	1

Table S2. AOD tendency (dAOD) per decade and statistics for the seasonal AOD time series linear fit (p value, bias, slope and absolute error (ae, %)) for the overlapping period (2000-2011) for different regions. dAOD is highlighted in bold if the correspondent p value <0.05.

region	ADV					MODIS				
	dAOD /decade	p value	bias	slope	ae, %	dAOD /decade	p value	bias	slope	ae, %
DJF										
China	0.041	0.0876	-7.99	0.004	8.5	0.053	0.0095	-10.39	0.005	4.8
China, SE	0.082	0.0106	-16.03	0.008	7.5	0.095	0.0038	-18.64	0.010	4.7
1	0.011	0.8944	-1.89	0.001	23.3	0.163	0.0405	-32.10	0.016	9.8
2	0.014	0.6495	-2.47	0.001	7.9	0.160	0.0140	-31.56	0.016	8
3	0.083	0.0301	-16.25	0.008	8.7	0.080	0.0866	-15.55	0.008	7.7
4	0.131	0.0335	-25.97	0.013	14.6	0.145	0.0064	-28.52	0.014	6.5
5	0.146	0.0909	-29.10	0.015	33.9	0.078	0.1648	-15.36	0.008	13.6
6	0.151	0.2677	-29.84	0.015	24.7	0.196	0.1893	-38.72	0.020	19.6
7	0.146	0.0067	-28.90	0.015	8.9	0.105	0.1443	-20.61	0.011	10.3
8	-0.006	0.4981	1.27	-0.001	28	-0.024	0.0898	4.90	-0.002	10.8
9	-0.004	0.9558	0.64	0.000	49.2	0.052	0.4005	-10.13	0.005	24.4
10	0.049	0.2445	-5.41	0.003	34.5	0.053	0.3362	-10.41	0.005	14.3
MAM										
China	-0.050	0.1875	10.39	-0.005	12	-0.001	0.9740	0.72	0.000	8.5
China, SE	0.002	0.9602	0.07	0.000	7.7	0.041	0.2429	-7.51	0.004	4.8
1	-0.100	0.1829	20.59	-0.010	13	0.053	0.5070	-9.90	0.005	9.5
2	-0.033	0.6534	7.22	-0.003	11	0.022	0.6161	-3.47	0.002	4.6
3	0.062	0.2263	-11.95	0.006	9.1	0.090	0.0330	-17.50	0.009	5.3
4	0.054	0.4410	-10.26	0.005	11.4	0.105	0.0434	-20.19	0.010	5.5
5	-0.094	0.1744	19.11	-0.009	18.1	-0.028	0.5257	6.16	-0.003	8.4
6	0.087	0.3502	-16.94	0.009	16.1	0.075	0.1936	-14.15	0.007	6.2
7	0.182	0.0167	-35.89	0.018	8.9	0.171	0.0096	-33.60	0.017	6.9
8	-0.068	0.1377	13.73	-0.007	44.3	0.006	0.7493	-1.07	0.001	8.5
9	-0.248	0.4168	45.63	-0.023	77.3	0.105	0.4544	-20.21	0.010	16
10	-0.044	0.6433	9.16	-0.004	33.9	-0.088	0.3951	18.11	-0.009	20.4
JJA										
China	0.038	0.2000	-7.36	0.004	8.7	0.054	0.0741	-10.47	0.005	6.6
China, SE	0.168	0.0138	-33.19	0.017	9.8	0.154	0.0073	-30.26	0.015	6.7
1	0.503	0.0037	-100.04	0.050	14	0.422	0.0008	-83.71	0.042	8.6
2	0.159	0.0388	-31.18	0.016	9.9	0.283	0.0002	-55.91	0.028	5.4
3	0.074	0.0905	-14.35	0.007	8.7	0.045	0.3357	-8.55	0.005	7.8
4	0.248	0.0009	-49.24	0.025	9.1	0.125	0.0159	-24.48	0.013	6.1
5	0.203	0.1506	-40.11	0.020	20.6	0.185	0.0609	-36.42	0.018	12.5
6	0.051	0.5528	-9.75	0.005	14.4	0.111	0.0594	-21.51	0.011	7.4
7	-0.024	0.7824	5.23	-0.002	15.5	0.057	0.3645	-10.71	0.006	8.9
8	-0.004	0.2983	0.97	0.000	3.9	0.001	0.9397	-0.06	0.000	8.9
9	0.072	0.0566	-14.26	0.007	15.2	0.025	0.6677	-4.64	0.003	12.5
10	-0.039	0.6352	8.24	-0.004	23.1	0.068	0.2889	-13.25	0.007	14.9
SON										
China	0.016	0.3516	-3.10	0.002	8.3	0.046	0.0134	-9.02	0.005	5.7
China, SE	0.076	0.1051	-14.83	0.008	10.4	0.099	0.0205	-19.37	0.010	7.1
1	0.105	0.1448	-20.59	0.010	13.7	0.178	0.0031	-35.06	0.018	7.3
2	0.160	0.0176	-31.69	0.016	11.5	0.156	0.0117	-30.64	0.016	7.5
3	0.124	0.0794	-24.38	0.012	15.1	0.082	0.2504	-16.05	0.008	13
4	0.128	0.1004	-25.23	0.013	12.5	0.148	0.0440	-28.96	0.015	9.5
5	0.018	0.7693	-3.33	0.002	19.1	0.062	0.0647	-12.02	0.006	7.9
6	0.077	0.3468	-14.99	0.008	16.1	0.066	0.2651	-12.60	0.007	8.6
7	0.068	0.5146	-12.99	0.007	17	0.117	0.2412	-22.80	0.012	14.4
8	-0.001	0.7646	0.24	0.000	10.6	-0.007	0.6050	1.57	-0.001	9.9
9	0.038	0.0955	-7.46	0.004	18.7	0.018	0.5866	-3.46	0.002	15.9
10	-0.002	0.9435	0.62	0.000	22.6	0.076	0.1064	-15.03	0.008	17.6

Table S3. AOD tendency (dAOD) per decade and statistics for the annually combined AOD time series linear fit (p value, bias, slope and absolute error (ae, %)) for the overlapping period (2000-2011) for different regions (r, where region 11 is the whole mainland China and region 12 is mainland SE China). dAOD is highlighted in bold if the correspondent p-value <0.05.

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region	ADV					MODIS				
	dAOD /decade	p value	bias	slope	ae, %	dAOD /decade	p value	bias	slope	ae, %
China	0.013	0.4132	-2.43	0.001	6.1	0.035	0.0682	-6.75	0.004	4.9
China, SE	0.082	0.0222	-15.91	0.008	6.4	0.096	0.0046	-18.78	0.010	4.5
1	0.148	0.0289	-29.17	0.015	9.1	0.201	0.0010	-39.64	0.020	5.6
2	0.083	0.0108	-16.20	0.008	4.6	0.149	0.0002	-29.13	0.015	3.4
3	0.095	0.0064	-18.69	0.010	6.2	0.078	0.0431	-15.17	0.008	5.9
4	0.139	0.0074	-27.32	0.014	7.5	0.127	0.0010	-24.82	0.013	4
5	0.029	0.6810	-5.33	0.003	15.7	0.069	0.1275	-13.45	0.007	8.5
6	0.070	0.3301	-13.47	0.007	12.5	0.091	0.0258	-17.61	0.009	4.7
7	0.104	0.0637	-20.40	0.010	8.6	0.118	0.0153	-23.00	0.012	6
8	-0.002	0.5667	0.56	0.000	6	-0.006	0.4978	1.32	-0.001	5.6
9	0.058	0.0297	-11.41	0.006	11.6	0.042	0.4006	-8.10	0.004	11
10	-0.035	0.5447	7.30	-0.004	21.5	0.017	0.7160	-3.15	0.002	12.6

10

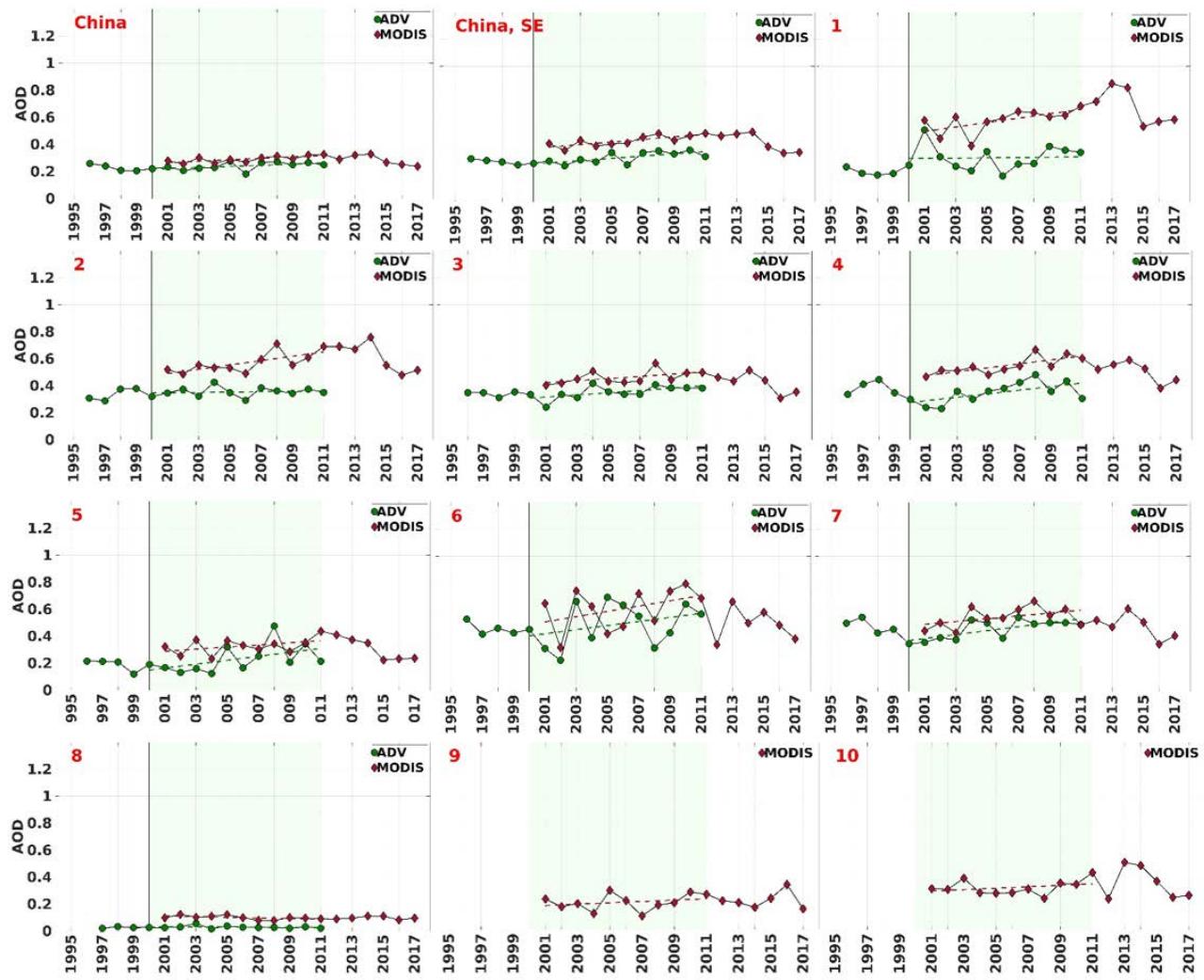


Figure S1. Time series of the seasonally averaged AOD for winter over China, SE China and each of the 10 selected regions, for ADV (1995-2011, green circles) and MODIS (2000-2017, red circles). The overlapping period is colored with light green. AOD linear fits for the overlapping periods are shown for each instrument (green and red dashed lines for ADV and MODIS, respectively). Statistics for linear fits are shown in Table S2.

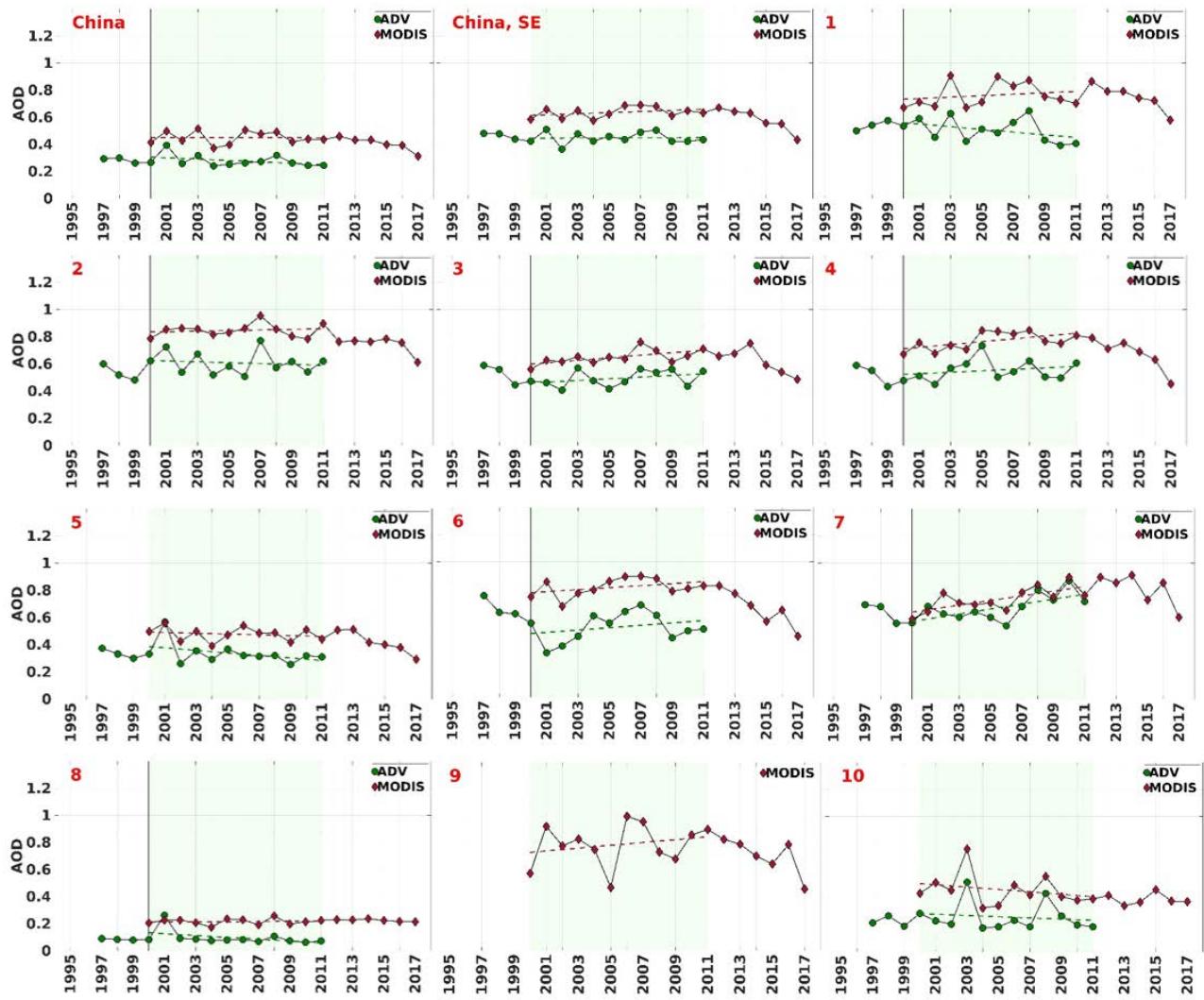


Figure S2. As Fig. S1, for spring.

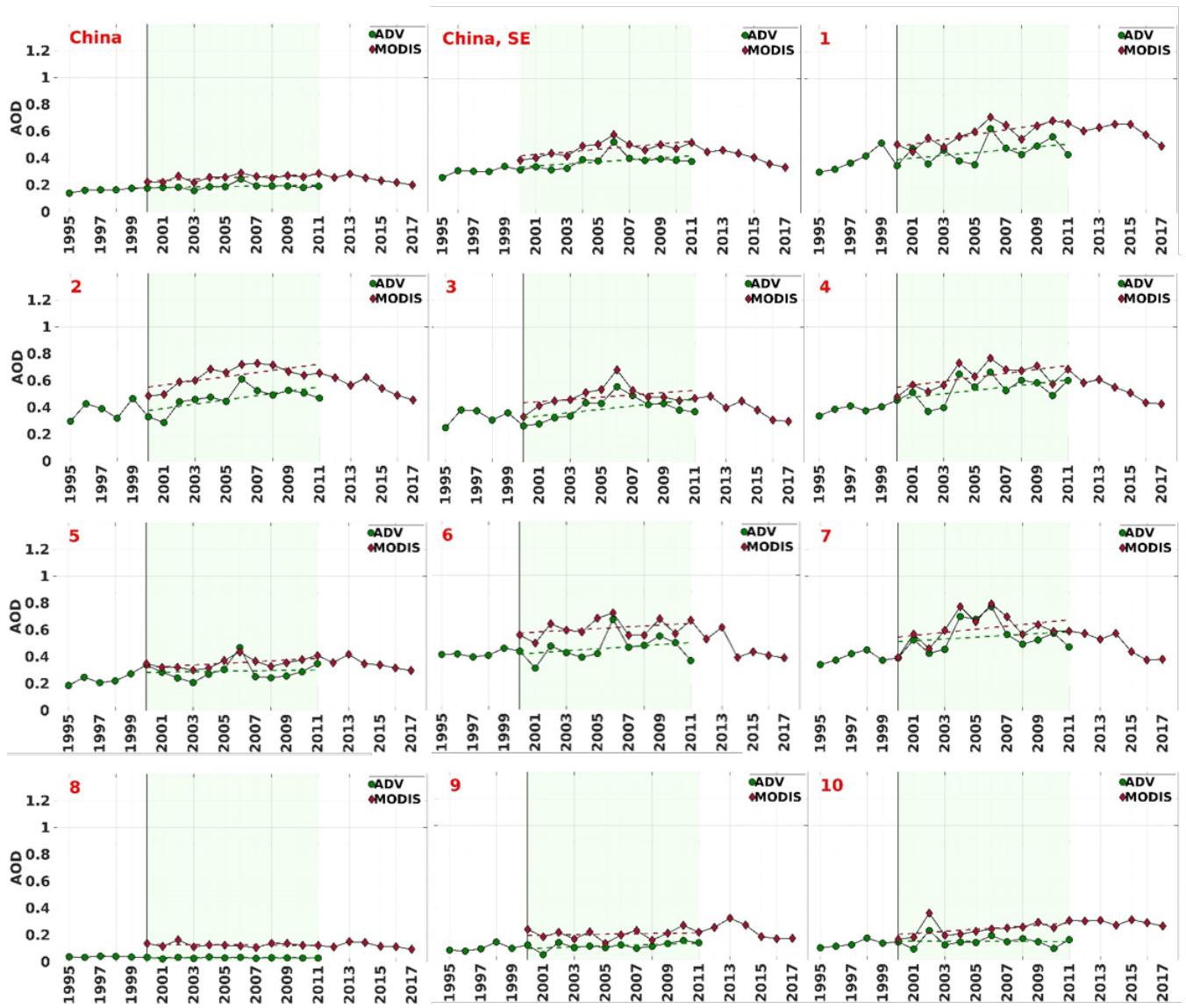


Figure S3. As Fig. S1, for autumn.

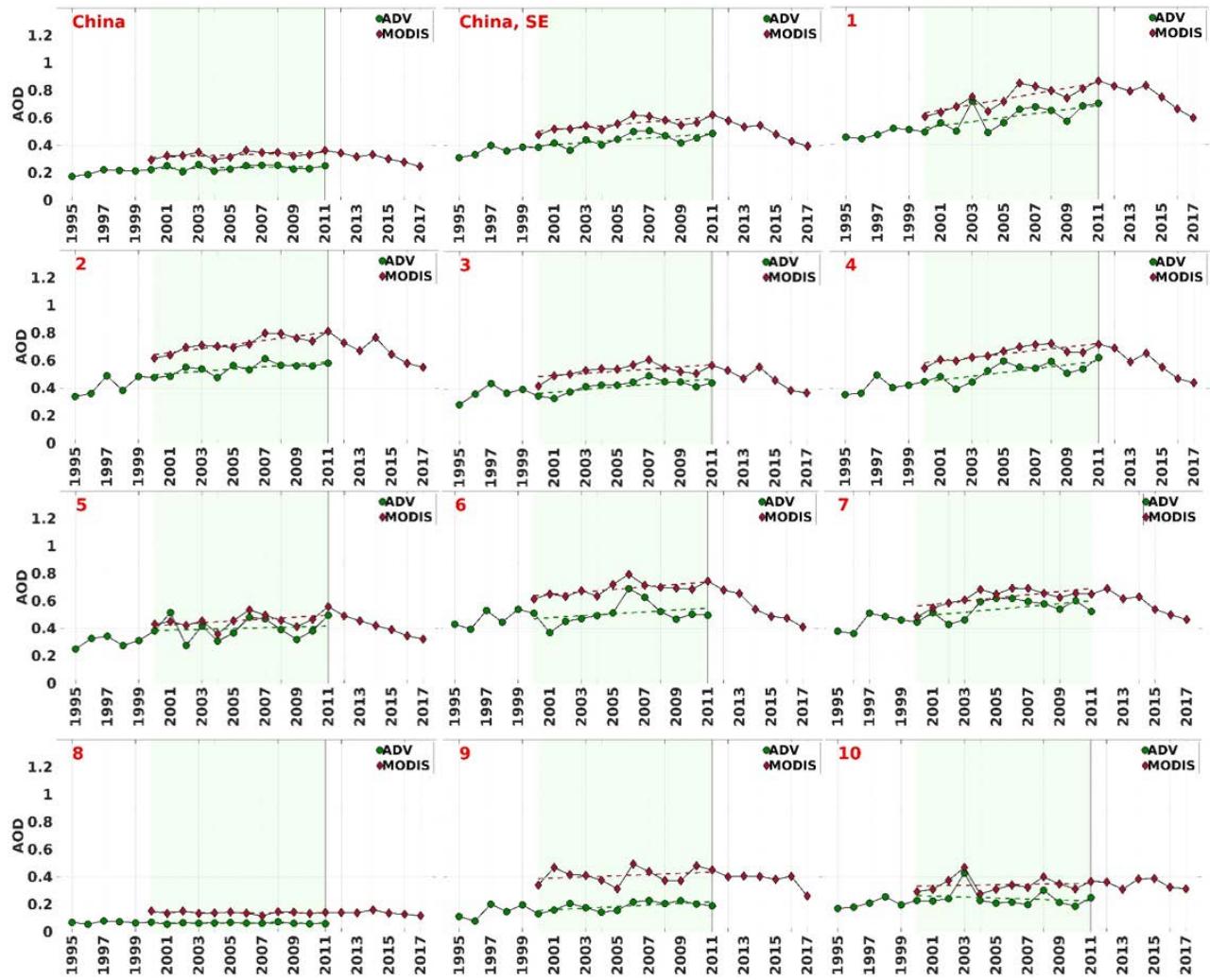


Figure S4. As Fig. S1, for annual AOD.