

Article

Estimation of Satellite-Based SO_4^{2-} and NH_4^+ Composition of Ambient Fine Particulate Matter over China Using Chemical Transport Model

Yidan Si ^{1,2}, Shenshen Li ^{1,*}, Liangfu Chen ^{1,*}, Chao Yu ¹ and Wende Zhu ³

¹ State Key Laboratory of Remote Sensing Science, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, Beijing 100101, China; siyd@radi.ac.cn (Y.S.); yuchao@radi.ac.cn (C.Y.)

² University of the Chinese Academy of Sciences, Beijing 100049, China

³ School of Computer and Information Engineering, Henan University, Kaifeng 475004, China; timmy_21@126.com

* Correspondence: liss01@radi.ac.cn (S.L.); lfchen@radi.ac.cn (L.C.)

The appendix contains details and data supplemental to the main text, and clarifies that the available $\text{PM}_{2.5}$ data before 2013 and composition data during 2004-2014 collected from the previous literature are used to validate and evaluate the simulated results derived from GEOS-Chem and satellite-estimated datasets, respectively.

Table S1. Ground measurements collected from publications.

City	lat	lon	(μg/m ³)			Sample Period	Source
			PM _{2.5}	SO ₄ ²⁻	NH ₄ ⁺		
Akdala	47.10	88.00		3.3	0.6	Jul 2004 - Dec 2004, Feb 2005 - Mar 2005	(Qu et al.,2008,2009)
Baoding	38.88	115.47		8.46	4.955	Aug 2009	(Li et al.,2013)
Baoding	38.88	115.47		3.69	0.21	Sep 2009	(Li et al.,2013)
Baoding	38.88	115.47		6.835	2.15	Oct 2009	(Li et al.,2013)
Baoding	38.88	115.47		23.32	16.025	Nov 2009	(Li et al.,2013)
Baoding	38.88	115.47		36.53	19.57	Dec 2009	(Li et al.,2013)
Baoding	38.88	115.47		33.59	16.175	Jan 2010	(Li et al.,2013)
Baoding	38.88	115.47		8.285	14.87	Feb 2010	(Li et al.,2013)
Baoding	38.88	115.47		13.895	3.56	Mar 2010	(Li et al.,2013)
Baoding	38.88	115.47		7.785	2.82	Apr 2010	(Li et al.,2013)
Baoding	38.88	115.47		6.1	0.035	May 2010	(Li et al.,2013)
Baoding	38.88	115.47		16.225	6.205	Jun 2010	(Li et al.,2013)
Baoding	38.88	115.47		29.2	27.295	Jul 2010	(Li et al.,2013)
Baoding	38.88	115.47		23.215	9.37	Aug 2010	(Li et al.,2013)
Baoding	38.88	115.47		40.855	15.525	Sep 2010	(Li et al.,2013)
Baoding	38.88	115.47		26.805	14.72	Oct 2010	(Li et al.,2013)
Baoding	38.88	115.47		11.25	4.795	Nov 2010	(Li et al.,2013)
Baoding	38.88	115.47		18.2	8.4	Dec 2010	(Li et al.,2013)
Baoding	38.88	115.47		61.2	37.32	Feb 2011	(Li et al.,2013)
Baoding	38.88	115.47		6.355	4.21	Mar 2011	(Li et al.,2013)
Baoding	38.88	115.47		9.555	4.985	Apr 2011	(Li et al.,2013)
Baoding	38.88	115.47		12.325	6.825	May 2011	(Li et al.,2013)
Baoding	38.88	115.47		14.34	4.395	Jun 2011	(Li et al.,2013)
Baoding	38.88	115.47		33.905	15.485	Jul 2011	(Li et al.,2013)
Baoding	38.88	115.47		26.62	10.475	Aug 2011	(Li et al.,2013)
Baolin	39.56	116.17	70.6			Mar 2004 - May 2004	(Zhao et al.,2009)
Baolin	39.56	116.17	84.5			Jun 2005 - Aug 2005	(Zhao et al.,2009)

Baolin	39.56	116.17	122.3			Sep 2005 - Nov 2005	(Zhao et al.,2009)
Baolin	39.56	116.17	63.3			Dec 2005 - Feb 2006	(Zhao et al.,2009)
Baolin	39.56	116.17	99.7			Mar 2006 - May 2006	(Zhao et al.,2009)
Baolin	39.56	116.17	81.3			Jun 2006 - Aug 2006	(Zhao et al.,2009)
Baolin	39.56	116.17	81.1			Sep 2006 - Nov 2006	(Zhao et al.,2009)
Baolin	39.56	116.17	112			Dec 2006 - Feb 2007	(Zhao et al.,2009)
Baolin	39.56	116.17	74.2			Mar 2007 - May 2007	(Zhao et al.,2009)
Baolin	39.56	116.17	91.7			Jun 2007 - Aug 2007	(Zhao et al.,2009)
Baolin	39.56	116.17	74.2			Sep 2007 - Nov 2007	(Zhao et al.,2009)
Baolin	39.56	116.17	98			Dec 2007 - Feb 2008	(Zhao et al.,2009)
Beijing	40.32	116.32	118.5	15.8	7.3	Mar 2005 - Feb 2006	(Yang et al.,2011)
Beijing	39.93	116.28	65.6	50		2005	(Yu et al.,2011)
Beijing	39.93	116.28	63.3	53		2006	(Yu et al.,2011)
Beijing	39.93	116.28	64.2	47		2007	(Yu et al.,2011)
Beijing	39.98	116.35	112.4	24.2	15.8	2009	(Wang et al.,2015)
Beijing	39.98	116.34	33.3			2009 - 2011	(Xin et al.,2014)
Beijing	39.99	116.30	55.4			2010	(Yu et al.,2013)
Beijing	39.98	116.34	57.3	14	7.72	Jul 2008 - Sep 2008	(Song et al.,2012)
Beijing	39.98	116.34	142	12.7	8.55	Sep 2009 - Dec 2009	(Song et al.,2012)
Beijing	39.90	116.30	123.45	19.07	0.37	Apr 2009,Jul 2009,Oct 2009, Jun 2010	(Zhao et al.,2013)
Beijing	39.99	116.30	135	13.6	6.9	Apr 2009,Jul 2009,Oct 2009, Jan 2010	(Zhang et al.,2013)
Beijing	39.95	116.30	92.6	14.6	8.3	Jun 2009, Sep 2009, Dec 2009, Mar 2010	(Liu et al.,2014)
Beijing	39.98	116.34	125	24.6	13.5	Jul 2009 - Sep 2009	(Song et al.,2012)
Beijing	39.98	116.34	138	12.1	8	Sep 2009 - Dec 2009	(Song et al.,2012)
Beijing	39.91	116.41	123.4	19.07	6.37	2009-2010	(Zhao et al.,2013)
Beijing	39.91	116.41	127.6	16.42	6.77	Apr 2009	(Zhao et al.,2013)
Beijing	39.91	116.41	115.8	33.76	8.43	Jul 2009	(Zhao et al.,2013)

Beijing	39.91	116.41	124.3	11.53	5.01	Oct 2009	(Zhao et al.,2013)
Beijing	39.91	116.41	126.5	14.23	5.21	Jan 2010	(Zhao et al.,2013)
Beijing	39.96	116.36		22.69	6.25	Sep 2009	(Li et al.,2013)
Beijing	39.96	116.36		4.75	0.91	Oct 2009	(Li et al.,2013)
Beijing	39.96	116.36		16.66	6.24	Nov 2009	(Li et al.,2013)
Beijing	39.96	116.36		15.18	2.63	Dec 2009	(Li et al.,2013)
Beijing	39.96	116.36		15.32	4.49	Jan 2010	(Li et al.,2013)
Beijing	39.96	116.36		5.84	2.6	Feb 2010	(Li et al.,2013)
Beijing	39.96	116.36		9.53	2.09	Mar 2010	(Li et al.,2013)
Beijing	39.96	116.36		10.07	4.19	Apr 2010	(Li et al.,2013)
Beijing	39.96	116.36		11.28	1.11	May 2010	(Li et al.,2013)
Beijing	39.96	116.36		15.31	2.82	Jun 2010	(Li et al.,2013)
Beijing	39.96	116.36		37.01	33.75	Jul 2010	(Li et al.,2013)
Beijing	39.96	116.36		13.98	8.39	Aug 2010	(Li et al.,2013)
Beijing	39.96	116.36		22.36	10.17	Sep 2010	(Li et al.,2013)
Beijing	39.96	116.36		12.87	12.965	Oct 2010	(Li et al.,2013)
Beijing	39.96	116.36		7.725	1.41	Nov 2010	(Li et al.,2013)
Beijing	39.96	116.36		14.94	4.395	Dec 2010	(Li et al.,2013)
Beijing	39.96	116.36		48.92	35.75	Feb 2011	(Li et al.,2013)
Beijing	39.96	116.36		7.86	3.343	Mar 2011	(Li et al.,2013)
Beijing	39.96	116.36		16.725	11.74	Apr 2011	(Li et al.,2013)
Beijing	39.96	116.36		17.665	9.045	May 2011	(Li et al.,2013)
Beijing	39.96	116.36		41.03	20.94	Jun 2011	(Li et al.,2013)
Beijing	39.96	116.36		48.01	6.74	Jul 2011	(Li et al.,2013)
Beijing	39.96	116.36		34.625	16.895	Aug 2011	(Li et al.,2013)
Beijing	39.91	116.41		32.774	24.400	Feb 2011	(Qiao et al.,2014)
Beijing	39.91	116.41		6.076	6.032	Mar 2011	(Qiao et al.,2014)
Beijing	39.91	116.41		10.736	7.729	Apr 2011	(Qiao et al.,2014)
Beijing	39.91	116.41		10.555	5.709	May 2011	(Qiao et al.,2014)
Beijing	39.91	116.41		39.431	20.837	Jun 2011	(Qiao et al.,2014)

Beijing	39.91	116.41		35.965	19.292	Jul 2011	(Qiao et al.,2014)
Beijing	39.91	116.41		24.992	13.013	Aug 2011	(Qiao et al.,2014)
Beijing	39.91	116.41		19.216	11.606	Sep 2011	(Qiao et al.,2014)
Beijing	39.91	116.41		18.526	15.103	Oct 2011	(Qiao et al.,2014)
Beijing	39.91	116.41		11.164	9.690	Nov 2011	(Qiao et al.,2014)
Beijing	39.91	116.41		9.108	6.764	Dec 2011	(Qiao et al.,2014)
Beijing	39.91	117.5		116.278		2011	(Qiao et al.,2014)
Beijing Beisihuan	39.98	116.34	125	24.6	13.5	Jun 2006,Jul 2006,Aug 2006	(Song et al.,2012)
Beijing Heishanzhai	40.36	116.31		18.23	9.7	Jun 2006,Jul 2006,Aug 2006	(Song et al.,2012)
Benxi	41.90	123.47	78.2			2007	(Guo et al.,2009)
CAS	39.98	116.39	273.2	15.2	2.9	Mar 2006 - Apr 2006	(Zhou et al.,2012)
CAS	39.98	116.39	119	29.9	9.3	Jul 2006 - Aug 2006	(Zhou et al.,2012)
CAS	39.98	116.39	194.2	18.6	7.7	Oct 2006 - Nov 2006	(Zhou et al.,2012)
CAS	39.98	116.39	162.2	20.3	7.3	Dec 2006	(Zhou et al.,2012)
CAS	39.98	116.39	176.6	22.4	7.3	2006	(Zhou et al.,2012)
CAS	39.98	116.39		21.3	12.5	Sep 2006 - Aug 2007	(Li et al.,2013)
CAS	39.98	116.39		10.8	11.7	Mar 2007 - May 2007	(Li et al.,2013)
CAS	39.98	116.39		12.6	21.4	Jun 2007 - Aug 2007	(Li et al.,2013)
CAS	39.98	116.39		18.2	9.6	Sep 2006 - Nov 2006	(Li et al.,2013)
CAS	39.98	116.39		43.7	7.4	Dec 2006 - Feb 2007	(Li et al.,2013)
Changsha	28.16	112.95	92.3			Jun 2009 - Oct 2009	(Yang et al.,2010)
Changsha	39.98	116.39	72.3			Jul 2006 - Aug 2006	(Li et al.,2007)
Chengdu	30.7	104		40.5	14	2006 - 2007	(Zhang et al.,2012)
Chengdu	30.61	104.04	133.2	15.5	4.6	Apr 2009 - May 2009	(Yang et al.,2012)
Chengdu	30.66	104.00	165.1	32.8	10.4	Apr 2009 - Jan 2010	(Li et al.,2014)
Chengdu	30.66	104.00	165	33	10.4	Apr 2009,Jul 2009, Oct 2009,Jan 2010	(Tao et al.,2013)
Chengdu	30.65	104.03	119	25	11.6	Apr 2011,Jun 2011, Jul 2011,Oct 2011	(Tao et al.,2014)
Chengdu	30.58	104.07	123			Aug 2012	(Tao et al.,2014)

Chengdu	30.58	104.07	133.2	15.5	11.27	Apr 2009,May 2009	(Yang et al.,2012)
Chengdu	30.58	104.07	113.5			Jun 2009,Jul 2009,Aug 2009	(Tao et al.,2013)
Chengdu	30.58	104.07	188			Sep 2009,Oct 2009,Nov 2009	(Tao et al.,2013)
Chengdu	30.58	104.07	225.5			Dec 2009,Jan 2010	(Tao et al.,2013)
Chinese Academy of Environmental Sciences	40.05	116.42		20.74	10.85	Aug 2008	(Gao et al.,2013)
Chongqing	29.57	106.53	129.6	25.6	7.9	Mar 2005 - Feb 2006	(Yang et al.,2011)
Chongqing	29.57	106.56	215.3	50.47	22.8	Dec 2007	(Huo et al.,2012)
Chongqing Dadukou	29.5	106.5		23.4	7.7	Mar 2005 - Feb 2006	(He et al.,2012)
CSV Guanghzou	23.15	113.37	107.5			Jul 2004 - Aug 2004	(Duan et al.,2007)
CSV Guanghzou	23.15	113.37	129.9			Nov 2004 - Jan 2005	(Duan et al.,2007)
CSV Guanghzou	23.15	113.37	81.7	5.6	4.7	Dec 2008 - Feb 2009	(Yang et al.,2011)
Daihai	39.86	111.27	64.5			Aug 2005 - Sep 2005	(Han et al.,2008)
Daihai	39.86	111.27	115			Jan 2006	(Han et al.,2008)
Daihai	39.86	111.27	50.7			Jun 2006 - Jul 2006	(Han et al.,2008)
Daihai	39.86	111.27	71.4			Apr 2007 - May 2007	(Han et al.,2008)
Dinghu	23.16	112.57	30.8	10.24	3.04	Aug 2008	(Li et al.,2010,Wang et al.,2008)
Dunhuang	40.2	94.7		6.6	0.4	2006 - 2007	(Zhang et al.,2012)
Duolun	42.20	116.52	64.1			Mar 2007 - Apr 2007	(Deng et al.,2011)
Erdos	39.62	109.79	51.8	1.07		Sep 2005	(Wang et al.,2012,Zhang et al.,2010)
Gaolanshan	36	105.9		16.7	6.5	2006 - 2007	(Zhang et al.,2012)
Guangdong Longtang	23.61	113.08	50.7			Apr 2009	(Wei et al.,2011)
Guangdong Longtang	23.61	113.08	115.6			Jan - Feb 2010	(Wei et al.,2011)
Guangdong Environment Observatory	23.11	113.34	102.9	27.8	12.1	Oct - Nov 2004	(Andreae et al.,2008)
Guangdong University of Technology	23.04	113.4		23.35		Sep 2006	(Gao et al.,2011)

Guangdong University of Technology	23.04	113.4		26.52		Oct 2006	(Gao et al.,2011)
Guangdong University of Technology	23.04	113.4		24.72		Jan 2007	(Gao et al.,2011)
Guangdong Wanqingsha	22.71	112.50	55	13.1	4.8	May 2005	(Pathak et al.,2009)
Guangdong Wanqingsha	22.71	112.50	59	12.7	5	May 2005	(Pathak et al.,2011)
Guangdong Wanqingsha	22.71	112.50	80.2			Aug - Sep 2008	(Ding et al.,2012)
Guangdong Wanqingsha	22.71	112.50	103			Nov - Dec 2008	(Ding et al.,2012)
Guangdong Wanqingsha	22.71	112.50	70.8	13.45	5.95	Nov - Dec 2010	(Wang et al.,2012)
Guangdong Wanqingsha	22.71	112.50	113	24.2	5.9	Oct - Nov 2007	(Ding et al.,2011)
Guangzhou	23.09	113.30	42.4			Aug 2006 - Aug 2007	(Huang et al.,2010)
Guangzhou	22.71	113.55	113	24.2	5.9	Oct 2007 - Nov 2007	(Ding et al.,2011)
Guangzhou	22.71	113.53	91.6			Aug 2008 - Dec 2008	(Ding et al.,2012)
Guangzhou	23.25	113.60	81.7			Dec 2008 - Feb 2009	(Yang et al.,2011)
Guangzhou	23.12	113.35	76.8	18.1	5.1	Apr 2009,Jul 2009, Oct 2009,Jan 2010	(Tao et al.,2014)
Guangzhou	23.10	113.35	91.4			Apr 2009,Jul 2009, Oct 2009,Jan 2010	(Lin et al.,2013)
Guangzhou	22.71	113.55	70.8	13.5	5.9	Nov - Dec 2010-	(Wang et al.,2012)
Guangzhou	23.7	113.21	53.7	14.2	3.2	Jul 2008	(Tao et al.,2012)
Guangzhou	23.12	113.32	134.8			Nov 2004 - Jan 2005	(Cao et al.,2012)
Dadaomingyue Road							
Guangzhou	23.09	113.32	104.58	27	5.08	Aug - Sep 2004	(Wang et al.,2006)
Haizhu District							
Guangzhou	23.13	113.25	91.4	42.69	7.41	Aug - Sep 2004	(Wang et al.,2006)
Liwan District							
Guangzhou	23.13	113.25	102.7			Aug - Sep 2004	(Duan et al.,2007)
Liwan District							
Guangzhou	23.13	113.25	118.8			Feb - Mar 2005	(Duan et al.,2007)
Liwan District							

Guangzhou Baiyun	23.16	113.28	90.85	31.22	6.07	Aug 2004 - Sep 2004	(Wang et al.,2006)
Guangzhou Dadaomingyue Road	23.12	113.32	69.5			Jul - Aug 2004	(Cao et al.,2012)
Guangzhou geochemical Institute	23.12	113.25	94.7	8.27	3.4	Dec 2007 - Jan 2008	(Tan et al.,2009)
Guangzhou Tianhe	23.13	112.50	103.5	26.52	5.9	Aug - Sep 2004	(Wang et al., 2006)
Guangzhou Tianhe	23.13	112.50	44.7			Jul - Aug 2004	(Cao et al., 2012)
Guangzhou Tianshou Road	23.15	112.50	72.2			Nov 2004 - Jan 2005	(Cao et al.,2012)
Guangzhou XingangxiRoad	23.10	113.31	88.6			Jul - Aug 2004	(Cao et al.,2012)
Guangzhou XingangxiRoad	23.10	113.31	216			Nov 2004 - Jan 2005	(Cao et al.,2012)
Guangzhou Yayuan	23.13	113.27	44.7			Jul - Aug 2004	(Cao et al.,2012)
Guangzhou Yayuan	23.13	113.27	64			Nov 2004 - Jan 2005	(Cao et al.,2012)
Gucheng	39.13	115.80	86.6			2007	(Guo et al.,2009)
Gucheng	39.13	115.80		35.5	14.4	2006 - 2007	(Zhang et al.,2012)
Guilin	25.32	110.30	66.9			2007	(Guo et al.,2009)
Guiyang	26.65	106.64	76			Apr - May 2012	(Xu et al.,2012)
Hangzhou	30.27	120.15	84.34			Sep 2010 - Jul 2011	(Sun et al., 2013)
Hangzhou	30.27	120.15	69			2006 - 2008	(Hong et al.,2013)
Hangzhou	30.24	120.12	77.5	12.815	5.323	2006	(Bao et al.,2010)
Hok Tsui	22.2	114.3		11.9	3.1	Nov 2004 - Oct 2005	(Guo et al.,2007)
Hong kong	22.33	114.10	30.5	10.2	2.9	Aug - Sep 2009, Jan - Feb 2010	(Yau et al.,2013)
Huaian	33.61	119.01	75			2008	(Cai et al.,2009)
Huaian	33.62	119.02	98			Mar - May2008	(Cai et al.,2009)
Huaian	33.62	119.02	67			Jun - Aug 2008	(Cai et al.,2009)
Huaian	33.62	119.02	45			Sep- Nov 2008	(Cai et al.,2009)
Huaian	33.62	119.02	90			Dec - Feb 2008	(Cai et al.,2009)
HuananInstitute of Environmental Science	23.13	113.37	79.2	21.6	7.3	Apr 2007	(Tao et al.,2009)

HuananInstitute of Environmental Science	23.13	113.37	103.3	17.8	6.5	Jan 2010	(Tao et al.,2012)
HuananInstitute of Environmental Science	23.13	113.37	79.7			Nov 2010	(Xu et al.,2013)
Huangpu Xinweixin Villege	23.19	113.49	111.2			Jul - Aug 2004	(Cao et al.,2012)
Huangpu Xinweixin Villege	23.19	113.49	111.2			Nov 2004 - Jan 2005	(Cao et al.,2012)
Huangpu Shihuayuan	23.11	113.48	66			Jul - Aug 2004	(Cao et al.,2012)
Huangpu Shihuayuan	23.11	113.48	83.5			Nov 2004 - Jan 2005	(Cao et al.,2012)
Jinan	36.67	117.03	123.2	24.7	11	Mar2006 - Feb 2007	(Yang et al.,2012)
Jinan	36.74	117.07		38.33	21.26	Oct 2007 - Oct 2008	(Gao et al.,2011)
Jinan	36.74	117.12		27.11	13.28	Mar - May 2008	(Gao et al.,2011)
Jinan	36.74	117.12		64.27	28.01	Jun - Jul 2008	(Gao et al.,2011)
Jinan	36.74	117.12		30.99	15.13	Oct - Nov 2007, Sep - Nov 2008	(Gao et al.,2011)
Jinan	36.74	117.12		42.84	29.19	Dec 2007,Jan - Feb 2008	(Gao et al.,2011)
Jinan	36.66	117.13	138	28.8	16.6	Nov 2004 - Sep 2005	(Yang et al.,2007)
Jinan	36.66	117.13	108	20.7	8.2	Mar 2004 - May 2004	(Yang et al.,2007)
Jinan	36.66	117.13	116	29.9	13.3	Jun 2004 - Aug 2004	(Yang et al.,2007)
Jinan	36.66	117.13	151	32	20.6	Nov 2004,Sep 2005	(Yang et al.,2007)
Jinan	36.66	117.13	177	32.6	24.3	Dev 2004 - Feb 2005	(Yang et al.,2007)
Jinan Forest Park	36.67	116.94	97.59			Mar 2006 - Feb 2007	(Yang et al.,2012)
Jinan Forest Park	36.67	116.94	93.46			Mar - May 2006	(Yang et al.,2012)
Jinan Forest Park	36.67	116.94	69.56			Jun - Aug 2006	(Yang et al.,2012)
Jinan Forest Park	36.67	116.94	93.21			Sep - Nov 2006	(Yang et al.,2012)
Jinan Forest Park	36.67	116.94	146.8			Dec 2006 - Feb 2007	(Yang et al.,2012)
Jinan University	23.13	112.50	56.5			Jul - Aug 2004	(Cao et al.,2012)
Jinan University	23.13	112.50	175			Nov - Dec 2004,Jau 2005	(Cao et al.,2012)
Jinsha	29.63	114.20	48.7	13.2	5.6	Mar 2012 - Mar 2013	(Zhang et al.,2014)

Jinsha	29.6	114.20		26.6	7.6	2006 - 2007	(Zhang et al.,2012)
Jinyun	29.8	106.4		24	7.3	Mar 2005 - Feb 2006	(Yang et al.,2011)
Karamay	43.89	87.56	73			Jan - Feb 2012	(Wu et al.,2012)
Lanzhou	36.07	103.84	111			Aug - Sep 2008	(Qu et al.,2013)
Lanzhou	36.07	103.84	208			Nov 2008 - Feb 2009	(Qu et al.,2013)
Lhasa	29.7	91.1		2.9	0.2	2006 - 2007	(Zhang et al.,2012)
Linan	30.3	119.7		21.7	6.8	2006 - 2007	(Zhang et al.,2012)
Linan	30.30	119.73	93.3			2007	(Guo et al.,2009)
Lushan	29.57	115.99	43.4			2007	(Guo et al.,2009)
Miyun	40.38	116.85	71	11.2	5.2	2005	(Wang et al.,2011)
Miyun	40.38	116.85	72.5	6.9	4.1	Mar - May 2005	(Wang et al.,2011)
Miyun	40.38	116.85	64.5	18.9	7.1	Jun - Aug 2005	(Wang et al.,2011)
Miyun	40.38	116.85	69.9	13.7	6.5	Sep - Nov 2005	(Wang et al.,2011)
Miyun	40.38	116.85	77.0	5.4	2.9	Dec 2005,Jan - Feb 2005	(Wang et al.,2011)
Miyun	40.5	116.8		13	6.1	Mar 2005 - Feb 2006	(Yang et al.,2011)
Mong Kok	22.3	114.1		12.8	4.4	Nov 2004 - Oct 2005	(Guo et al.,2007)
Mountain Changbai	42.11	128.09	38.8	12.97	3.94	Jul 2007	(Deng et al.,2011)
Mountain Longfeng	44.73	127.60	37.8			2007	(Guo et al.,2009)
Mountain Longfeng	44.73	127.60		10	2.5	2006 - 2007	(Zhang et al.,2012)
Mountain Mangdang	25.97	117.36	39.7	12.27	4.06	Dec 2012	(Yin et al.,2012)
Mountain Qilian	40.30	97.5		1.54	0.22	Jul 2010 - Jul 2011	(Wang et al.,2013)
Mountain Tai	36.25	117.10	123.1	20.26	9.56	Jun - Jul 2007	(Deng et al.,2011)
Mountain Tai	36.25	117.10	46.6	2.72	0.88	Mar - May 2007	(Deng et al.,2011)
Mountain Tai	36.25	117.10	70.1	2.72	0.88	Mar - May 2006	(Deng et al.,2011)
Mountain Tai	36.25	117.10	63	12.76	5.55	Mar - Apr 2007	(Zhou et al.,2012)
Mountain Tai	36.25	117.10	59.3	22.92	8.03	Jun - Jul 2007	(Zhou et al.,2012)
Mountain Tai	36.25	117.10	42.24			Oct - Nov 2008	(Li et al.,2010)
Mountain Tai	36.27	117.10	61.2			Mar - Jul 2007	(Zhou et al.,2012)
Nanchang	28.69	115.87		2.8	4.85	Jun 2006	(Huo et al.,2012)
Nanchang University	28.66.	15.81	83.4			Jun 2006	(Huang et al.,2011)

Nanjing	32.12	118.95	90			Nov 2011- Mar 2012	(Herrmann et al.,2013)
Nanjing	22.82	108.35	42.8			2007	(Guo et al.,2009)
Nanjing	32.05	118.76	103.0			Jun 2007 - May 2008	(Yang et al.,2010)
Nanjing	32.05	118.74	98.8			Jun2007 - May 2008	(Chen et al.,2010)
Nanjing	33.60	119.01	69.1			Jun - Sep 2004	(Huang et al.,2006)
Nanjing	33.60	119.01	139.5			Jan 2005	(Huang et al.,2006)
Nanjing	33.60	119.01	76.1			Jan 2011 - Apr 2011	(Zhuang et al.,2014)
Nanning	22.8	108.4		21.6	5.8	2006 - 2007	(Zhang et al.,2012)
Panyu	23	113.4		26.8	8.6	Jan 2006 - Dec 2007	(Zhang et al.,2012)
Peking University	39.99	116.32	135	13.6	6.9	2009-2010	(Zhang et al.,2013)
Peking University	39.99	116.32	126	14.7	7.5	Apr 2009	(Zhang et al.,2013)
Peking University	39.99	116.32	138	23.5	11	Jul 2009	(Zhang et al.,2013)
Peking University	39.99	116.32	135	7.9	4.7	Oct 2009	(Zhang et al.,2013)
Peking University	39.99	116.32	139	8.5	4.5	Jan 2010	(Zhang et al.,2013)
Qingdao	36.06	120.34	86.6			Jun 2007 - May 2008	(Li et al.,2012)
Qingdao	36.61	120.35	163			Oct - Nov 2011, Feb 2012, May 2012, Aug 2012	(Wu et al.,2013)
Qingdao	36.61	120.35	167			May 2012	(Wu et al.,2013)
Qingdao	36.61	120.35	160			Aug 2012	(Wu et al.,2013)
Qingdao	36.61	120.35	132			Oct - Nov 2011	(Wu et al.,2013)
Qingdao	36.61	120.35	191			Feb 2012	(Wu et al.,2013)
Qinghai Lake	36.98	99.90	21.3	3.9	0.6	Jun - Aug 2010	(Li et al.,2013)
Qinghai Lake	36.98	99.90	21.5	4.5		Jun - Sep 2010	(Li et al.,2013)
Qingyuan	23.70	113.06	84.1			Aug 2009 - Jan 2010	(Wei et al.,2011)
Qingyuan	23.69	113.06	50.7			Apr 2009	(Wei et al.,2011)
Qingyuan	23.69	113.06	119.6			Jan - Feb 2010	(Wei et al.,2011)
Shandong University	36.68	117.07	148.71			Mar 2006 - Feb 2007	(Yang et al.,2012)
Shandong University	36.68	117.07	143.25			Mar - May 2006	(Yang et al.,2012)
Shandong University	36.68	117.07	129.04			Jun - Aug 2006	(Yang et al.,2012)
Shandong University	36.68	117.07	134.89			Sep - Nov 2006	(Yang et al.,2012)

Shandong University	36.68	117.07	204.89			Dec 2006 - Feb 2007	(Yang et al.,2012)
Shangdianzi	40.65	117.12	71.8	13.8	4.5	Apr 2009,Jul 2009, Oct 2009,Jan 2010	(Zhao et al.,2013)
Shangdianzi	40.65	117.12	87.1	15.73	5.67	Apr 2009	(Zhao et al.,2013)
Shangdianzi	40.65	117.12	70.6	24.17	6.28	Jul 2009	(Zhao et al.,2013)
Shangdianzi	40.65	117.12	73.1	8.68	3.23	Oct 2009	(Zhao et al.,2013)
Shangdianzi	40.65	117.12	56.3	6.64	2.83	Jan 2010	(Zhao et al.,2013)
Shangdianzi	40.65	117.12	60.2			2007	(Guo et al.,2013)
Shangdianzi	40.65	117.12	51.9			2007	(Zhao et al.,2009)
Shangdianzi	40.39	117.07	44.7			Dec 2006 - Feb 2007	(Zhao et al.,2009)
Shangdianzi	40.39	117.07	59.8			Mar 2007 - May 2007	(Zhao et al.,2009)
Shangdianzi	40.39	117.07	58.5			Jun 2007- July 2007	(Zhao et al.,2009)
Shangdianzi	40.39	117.07	45.1			Sep 2007 - Nov 2007	(Zhao et al.,2009)
Shangdianzi	40.39	117.07	44.3			Dec 2007 - Feb 2008	(Zhao et al.,2009)
Shangdianzi	40.39	117.07	64.7			Jun 2005 - Aug 2005	(Zhao et al.,2009)
Shangdianzi	40.39	117.07	47.9			Sep 2005 - Nov 2005	(Zhao et al.,2009)
Shangdianzi	40.39	117.07	31.4			Dec 2005 - Feb 2006	(Zhao et al.,2009)
Shangdianzi	40.39	117.07	101.2			Mar 2006 - May 2006	(Zhao et al.,2009)
Shangdong Mazhuangzhen	36	117		46.33	22.35	Jul 2007	(Huo et al.,2012)
Shangri-La,Zhuzhuang	28	99.7		1.6	0.2	Jul 2004 - Mar 2005	(Qu et al.,2008,2009)
henyang	41.73	123.41	75			2006 - 2008	(Ma et al.,2011)
Shenzhen	22.55	114.07	34.9			Jun 2004 - Jul 2006	(Niu et al.,2006)
Shenzhen	22.55	114.07	99			Nov - Dec 2004	(Niu et al.,2006)
Shenzhen	22.59	113.97	42.2	11.7	3.5	2009	(Huang et al.,2014)
Shenzhen	22.55	114.07		8.6		Jun 2004 – Jul 2006	(Niu et al.,2006)
Shenzhen	22.55	114.07		23.90		Nov - Dec 2007	(Niu et al.,2006)
Shenzhen	22.55	114.07		13.68	5.47	Apr 2007	(Huo et al.,2012)
Shijiazhuang	38.02	114.52	99.4			Jun - Oct 2008	(Du et al.,2010)
Shijiazhuang	38.00	114.54	191.2	35.6	9.3	Apr 2009,Jul 2009, Oct 2009,Jan 2010	(Zhao et al.,2013)

Shijiazhuang	38.02	114.54	66.0			Jun - Jul 2012	(Ning et al.,2012)
Taiyangshan	29.2	111.7		28.8	7.9	Jan 2006 - Dec 2007	(Zhang et al.,2012)
Taiyuan	37.80	112.58	334.5	35.1		Dec 2011 - Jan 2012	(Jia et al., 2013)
Taiyuan	37.88	112.56	216.7			Dec 2005	(Meng et al., 2007)
Taiyuan	37.88	112.56	194.5			Jan 2006	(Meng et al., 2007)
Taiyuan	37.88	112.56	82.4			Feb 2006	(Meng et al., 2007)
Taizhou Luqiao	32.16	120.01	37.5			Jul 2007	(Gu et al., 2010)
Taizhou Luqiao	32.16	120.01	108.91			Jan 2007	(Gu et al., 2010)
Tianjin	39.10	117.50	109.8			Apr 2008,Jul 2008, Oct 2008,Jan 2009	(Gu et al., 2010)
Tianjin	39.10	117.20	141.47	24.97	7.64	Apr 2009,Jul 2009, Oct 2009,Jun 2010	(Zhao et al.,2013)
Tianjin	39.09	117.50	133.7			Jan 2008	(Gu et al.,2010)
Tianjin	39.09	117.50	107.5			Apr 2008	(Gu et al.,2010)
Tianjin	39.09	117.50	87			Jul 2008	(Gu et al.,2010)
Tianjin	39.09	117.50	111			Oct 2008	(Gu et al.,2010)
Tianjin	39.09	117.50	144.6			Jan 2008	(Gu et al.,2010)
Tianjin	39.09	117.50	163.2			Nov 2011 - Dec 2012	(Liu et al.,2013)
Tianjin	39.09	117.50	198			Mar - May 2011	(Liu et al.,2013)
Tianjin	39.08	117.21		10.785	9.575	Aug 2009	(Li et al.,2013)
Tianjin	39.08	117.21		19.105	6.66	Sep 2009	(Li et al.,2013)
Tianjin	39.08	117.21		5.45	3.415	Oct 2009	(Li et al.,2013)
Tianjin	39.08	117.21		16.57	9.405	Nov 2009	(Li et al.,2013)
Tianjin	39.08	117.21		41.925	31.885	Dec 2009	(Li et al.,2013)
Tianjin	39.08	117.21		20.445	7.805	Jan 2010	(Li et al.,2013)
Tianjin	39.08	117.21		6.97	6.35	Feb 2010	(Li et al.,2013)
Tianjin	39.08	117.21		10.675	0.625	Mar 2010	(Li et al.,2013)
Tianjin	39.08	117.21		9	2.575	Apr 2010	(Li et al.,2013)
Tianjin	39.08	117.21		9.91	0.09	May 2010	(Li et al.,2013)
Tianjin	39.08	117.21		7.965	1.375	Jun 2010	(Li et al.,2013)

Tianjin	39.08	117.21	33.93	35.105	Jul 2010	(Li et al.,2013)
Tianjin	39.08	117.21	21.75	9.86	Aug 2010	(Li et al.,2013)
Tianjin	39.08	117.21	46.205	20.965	Sep 2010	(Li et al.,2013)
Tianjin	39.08	117.21	9.145	6.035	Oct 2010	(Li et al.,2013)
Tianjin	39.08	117.21	11.235	3.24	Nov 2010	(Li et al.,2013)
Tianjin	39.08	117.21	18.59	10.585	Dec 2010	(Li et al.,2013)
Tianjin	39.08	117.21	23.04	13.62	Feb 2011	(Li et al.,2013)
Tianjin	39.08	117.21	7.425	3.375	Mar 2011	(Li et al.,2013)
Tianjin	39.08	117.21	10.915	7.005	Apr 2011	(Li et al.,2013)
Tianjin	39.08	117.21	10.885	4.895	May 2011	(Li et al.,2013)
Tianjin	39.08	117.21	24.115	13.235	Jun 2011	(Li et al.,2013)
Tianjin	39.08	117.21	43.165	13.075	Jul 2011	(Li et al.,2013)
Tianjin	39.08	117.21	22.955	11.855	Aug 2011	(Li et al.,2013)
Tianjin Atmospheric boundary layer meteorological station	39.08	117.22	21.98	8.18	Aug - Dec 2006	(Jiang et al.,2013)
Tianjin Atmospheric boundary layer meteorological station	39.08	117.22	24.1	8.7	Jan 2008	(Gu et al.,2011)
Tianjin Atmospheric boundary layer meteorological station	39.08	117.22	29	6.9	Nov - Dec 2011	(Gu et al.,2013)
Tianjin Atmospheric boundary layer meteorological station	39.08	117.22	34.39	2.18	Mar - May 2011	(Liu et al.,2013)
Tianjin Economic- Technological Development Area	39.08	117.22	3.17	0.29	Jun - Jul 2007	(Kong et al.,2010)

Tianjin Economic- Technological Development Area	39.08	117.22		1.73	0.28	Oct 2007	(Kong et al.,2010)
Tianjin Economic- Technological Development Area	39.08	117.22		0.89	0.05	Jan - Feb 2007	(Kong et al.,2010)
Tianjin Economic- Technological Development Area	39.07	117.50	115.9			Jun - Jul 2007	(Kong et al.,2010)
Tianjin Economic- Technological Development Area	39.07	117.50	174.1			Oct 2007	(Kong et al.,2010)
Tianjin Economic- Technological Development Area	39.07	117.50	70.9			Jan - Feb 2008	(Kong et al.,2010)
Tsinghua	40.01	116.33	124.9	13.4	6.8	2005	(Wang et al.,2011)
Tsinghua	40.01	116.33	125.6	8.7	4.9	Mar - May 2005	(Wang et al.,2011)
Tsinghua	40.01	116.33	101.3	20.3	8.8	Jun - Aug 2005	(Wang et al.,2011)
Tsinghua	40.01	116.33	115	13.4	7.5	Sep - Nov 2005	(Wang et al.,2011)
Tsinghua	40.01	116.33	157.7	11.4	6.1	Dec 2005,Jan - Feb 2005	(Wang et al.,2011)
Tsinghua	40.01	116.33		23.67	12.45	Jun - Jul 2011	(Cheng et al.,2013)
Tsinghua	40.01	116.33		15.72	8.88	Dec 2011 - Jan 2012	(Cheng et al.,2013)
Tsuen Wan	22.4	114		13.2	4.1	Nov 2004 - Oct 2005	(Guo et al.,2007)
Urumqi	43.83	87.62	63.6			Jul - Aug 2007	(Wang et al.,2012)
Urumqi	43.83	87.62	157.6			Oct - Nov 2007	(Wang et al.,2012)
Urumqi	43.83	87.62	253.2			Dec 2007 - Jan 2008	(Wang et al.,2012)
Urumqi	43.83	87.62	108.5			Apr - May 2008	(Wang et al.,2012)
Urumqi	43.83	87.62	145.7			Jul - Aug 2007, Oct - Dec 2007,Jan 2008, Apr - May 2008	(Wang et al.,2012)

Urumqi	43.83	87.62	79.6			Mar - May 2007	(Li et al.,2008)
Urumqi	43.83	87.62	64.4			Jun - Aug 2007	(Li et al.,2008)
Urumqi	43.83	87.62	131.6			Sep - Nov 2007	(Li et al.,2008)
Urumqi	43.83	87.62	223.7			Dec 2007,Jan - Feb 2007	(Li et al.,2008)
Urumqi	43.83	87.62	187.8			2007	(Li et al.,2008)
Urumqi	43.83	87.62		48.51	23.86	2004 - 2007	(Li et al.,2008)
Wuhan university	30.54	114.37	114			Jul - Aug 2011	(Cheng et al.,2012)
Wuhan university	30.54	114.37	133.5			Sep - Nov 2011	(Cheng et al.,2012)
Wuhan university	30.54	114.37	131			Dec 2011,Jan - Feb 2012	(Cheng et al.,2012)
Wuhan university	30.54	114.37	127			Jul - Dec 2011, Jan - Feb 2012	(Cheng et al.,2012)
Xiamen	24.43	118.08	53.4			2008 - 2012	(Yin et al.,2012)
Xiamen	24.61	118.06	32.7			2012	(Niu et al.,2013)
Xiamen	24.58	118.09	63.88			Apr 2009,Jul 2009, Oct 2009,Jan 2010	(Zhang et al.,2011)
Xiamen	24.48	118.04	74.8			Apr 2009,Jul 2009, Oct 2009,Jan 2010	(Zhang et al.,2011)
Xiamen	24.58	118.11	72.1			Apr 2009,Jul 2009, Oct 2009,Jan 2010	(Zhang et al.,2011)
Xiamen	24.43	118.08	53.4			2008 - 2011	(Chen et al.,2011)
Xiamen	32.06	118.80		14.8	5.2	Jan 2005	(Wang et al.,2003)
Xiamen	32.06	118.80		6.8	2.7	Jul 2005	(Wang et al.,2003)
Xiamen	32.06	118.80		11.22	4.54	Jun 2009 - May 2010	(Zhuang et al.,2007)
Xiamen	32.06	118.80		7.12	2.71	Jun - Aug 2009	(Zhuang et al.,2007)
Xiamen	32.06	118.80		10.31	3.86	Sep - Nov 2009	(Zhuang et al.,2007)
Xiamen	32.06	118.80		17.84	7.66	Dec 2009,Jan - Feb 2010	(Zhuang et al.,2007)
Xiamen	32.06	118.80		9.61	3.91	Mar - May 2010	(Zhuang et al.,2007)
Xiamen Jimei	24.58	117.50	89.72			Mar - May 2010	(Zhang et al.,2012)
Xiamen Jimei	24.58	117.50	62.26			Jun - Aug 2009	(Zhang et al.,2012)
Xiamen Jimei	24.58	117.50	83.75			Sep - Oct 2009	(Zhang et al.,2012)

Xiamen Jimei	24.58	117.50	108.91			Dec 2009,Jan - Feb 2010	(Zhang et al.,2012)
Xian	34.31	108.95	176.7			2004 - 2008	(Huang et al.,2011)
Xian	34.30	108.95	88.1			2007	(Guo et al.,2009)
Xian	34.4	109		46.7	14.4	2006 - 2007	(Zhang et al.,2012)
Xian	34.35	108.95		37.286	9.25	Jan 2004	(Qiao et al.,2014)
Xian	34.35	108.95		23.474	4.53	Feb 2004	(Qiao et al.,2014)
Xian	34.35	108.95		38.683	13.825	Mar 2004	(Qiao et al.,2014)
Xian	34.35	108.95		20.188	3.493	Apr 2004	(Qiao et al.,2014)
Xian	34.35	108.95		16.127	2.131	May 2004	(Qiao et al.,2014)
Xian	34.35	108.95		16.529	1.355	Jun 2004	(Qiao et al.,2014)
Xian	34.35	108.95		22.038	2.635	Jul 2004	(Qiao et al.,2014)
Xian	34.35	108.95		41.665	6.595	Aug 2004	(Qiao et al.,2014)
Xian	34.35	108.95		27.508	3.835	Sep 2004	(Qiao et al.,2014)
Xian	34.35	108.95		33.03	8.146	Oct 2004	(Qiao et al.,2014)
Xian	34.35	108.95		46.386	1.695	Nov 2004	(Qiao et al.,2014)
Xian	34.35	108.95		49.273	12.65	Dec 2004	(Qiao et al.,2014)
Xian	34.35	108.95		52.449	0.788	Jan 2005	(Qiao et al.,2014)
Xian	34.35	108.95		40.325	0.833	Feb 2005	(Qiao et al.,2014)
Xian	34.35	108.95		25.994	0.77	Mar 2005	(Qiao et al.,2014)
Xian	34.35	108.95		22.641	0.779	Apr 2005	(Qiao et al.,2014)
Xian	34.35	108.95		34.497	0.917	May 2005	(Qiao et al.,2014)
Xian	34.35	108.95		20.637	0.665	Jun 2005	(Qiao et al.,2014)
Xian	34.35	108.95		27.261	0.575	Jul 2005	(Qiao et al.,2014)
Xian	34.35	108.95		34.726	0.925	Aug 2005	(Qiao et al.,2014)
Xian	34.35	108.95		33.933	0.758	Sep 2005	(Qiao et al.,2014)
Xian	34.35	108.95		27.613	0.688	Oct 2005	(Qiao et al.,2014)
Xian	34.35	108.95		43.015	0.773	Nov 2005	(Qiao et al.,2014)
Xian	34.35	108.95		39.38	0.713	Dec 2005	(Qiao et al.,2014)
Xian	34.35	108.95		59.308	18.67	Jan 2006	(Qiao et al.,2014)
Xian	34.35	108.95		30.237	8.531	Feb 2006	(Qiao et al.,2014)

Xian	34.35	108.95	29.986	6.84	Mar 2006	(Qiao et al.,2014)
Xian	34.35	108.95	24.127	5.589	Apr 2006	(Qiao et al.,2014)
Xian	34.35	108.95	21.7	5.247	May 2006	(Qiao et al.,2014)
Xian	34.35	108.95	24.815	6.67	Jun 2006	(Qiao et al.,2014)
Xian	34.35	108.95	46.406	12.453	Jul 2006	(Qiao et al.,2014)
Xian	34.35	108.95	45.311	12.411	Aug 2006	(Qiao et al.,2014)
Xian	34.35	108.95	39.716	11.234	Sep 2006	(Qiao et al.,2014)
Xian	34.35	108.95	50.392	16.16	Oct 2006	(Qiao et al.,2014)
Xian	34.35	108.95	35.959	11.847	Nov 2006	(Qiao et al.,2014)
Xian	34.35	108.95	47.737	17.574	Dec 2006	(Qiao et al.,2014)
Xian	34.35	108.95	33.308	13.23	Jan 2007	(Qiao et al.,2014)
Xian	34.35	108.95	37.213	15.715	Feb 2007	(Qiao et al.,2014)
Xian	34.35	108.95	21.67	1.551	Mar 2007	(Qiao et al.,2014)
Xian	34.35	108.95	14.19	1.399	Apr 2007	(Qiao et al.,2014)
Xian	34.35	108.95	16.955	1.565	May 2007	(Qiao et al.,2014)
Xian	34.35	108.95	28.521	5.862	Jun 2007	(Qiao et al.,2014)
Xian	34.35	108.95	28.335	8.498	Jul 2007	(Qiao et al.,2014)
Xian	34.35	108.95	43.597	12.89	Aug 2007	(Qiao et al.,2014)
Xian	34.35	108.95	21.658	5.998	Sep 2007	(Qiao et al.,2014)
Xian	34.35	108.95	23.56	9.224	Oct 2007	(Qiao et al.,2014)
Xian	34.35	108.95	32.083	13.27	Nov 2007	(Qiao et al.,2014)
Xian	34.35	108.95	62.204	18.599	Dec 2007	(Qiao et al.,2014)
Xian	34.35	108.95	51.304	0.77	Jan 2008	(Qiao et al.,2014)
Xian	34.35	108.95	34.214	0.463	Feb 2008	(Qiao et al.,2014)
Xian	34.35	108.95	26.902	1.325	Mar 2008	(Qiao et al.,2014)
Xian	34.35	108.95	29.078	0.787	Apr 2008	(Qiao et al.,2014)
Xian	34.35	108.95	19.012	0.518	May 2008	(Qiao et al.,2014)
Xian	34.35	108.95	22.726	0.716	Jun 2008	(Qiao et al.,2014)
Xian	34.35	108.95	24.799	0.449	Jul 2008	(Qiao et al.,2014)
Xian	34.35	108.95	11.542	0.723	Aug 2008	(Qiao et al.,2014)

Xian	34.35	108.95		17.488	0.581	Sep 2008	(Qiao et al.,2014)
Xian	34.35	108.95		23.615	0.59	Oct 2008	(Qiao et al.,2014)
Xian	34.35	108.95		14.444	0.388	Nov 2008	(Qiao et al.,2014)
Xian	34.35	108.95		16.958	0.842	Dec 2008	(Qiao et al.,2014)
Xian	34.35	108.95		166.77		2004	(Qiao et al.,2014)
Xian	34.35	108.95		184.59		2005	(Qiao et al.,2014)
Xian	34.35	108.95		188.75		2006	(Qiao et al.,2014)
Xian	34.35	108.95		187.34		2007	(Qiao et al.,2014)
Xian	34.35	108.95		139.4		2008	(Qiao et al.,2014)
Xinglong	40.38	117.57		8.365	10.09	Sep 2009	(Li et al.,2013)
Xinglong	40.38	117.57		1.925	0.99	Oct 2009	(Li et al.,2013)
Xinglong	40.38	117.57		6.975	7.08	Nov 2009	(Li et al.,2013)
Xinglong	40.38	117.57		3.1175	0.07	Dec 2009	(Li et al.,2013)
Xinglong	40.38	117.57		8.39	4.012	Jan 2010	(Li et al.,2013)
Xinglong	40.38	117.57		1.7	0.145	Feb 2010	(Li et al.,2013)
Xinglong	40.38	117.57		5.665	2.1	Mar 2010	(Li et al.,2013)
Xinglong	40.38	117.57		11.22	5.58	Apr 2010	(Li et al.,2013)
Xinglong	40.38	117.57		8.0075	5.33	May 2010	(Li et al.,2013)
Xinglong	40.38	117.57		26.19	19.42	Jun 2010	(Li et al.,2013)
Xinglong	40.38	117.57		40.71	28.39	Jul 2010	(Li et al.,2013)
Xinglong	40.38	117.57		16.4025	12.6925	Aug 2010	(Li et al.,2013)
Xinglong	40.38	117.57		7.17	1.186	Sep 2010	(Li et al.,2013)
Xinglong	40.38	117.57		1.3825	0.025	Oct 2010	(Li et al.,2013)
Xinglong	40.38	117.57		2.4	0.02	Nov 2010	(Li et al.,2013)
Xinglong	40.38	117.57		0.825	0.0225	Dec 2010	(Li et al.,2013)
Yongan	25.97	117.36	84.1			Apr 2007 - Jun 2008	(Yin et al.,2012)
Yulin	38.29	109.74	83			Mar - Apr 2007	(Deng et al.,2011)
Zhengzhou	34.78	113.68	110.2		16.5	2007	(Guo et al.,2009)
Zhengzhou	34.80	113.52	175	25.7	15.6	2010	(Geng et al.,2013)
Zhengzhou	34.8	113.7		45	16.5	2006 - 2007	(Zhang et al.,2012)

Zhongshan University	23.10	113.31	52.4	Jul -Aug 2004	(Cao et al.,2012)
Zhongshan University	23.10	113.31	120.6	Nov - Dec 2004,Jan 2005	(Cao et al.,2012)
Zhusanjiao	23.14	113.27	97	Oct 2004	(Wang et al.,2008)