

Dataset S1

1. Note that scaling of INP for total particle number (e.g., Fig. 1a) is not applied to laboratory data in this table.
2. Surface areas in CFDC measurements account for the use of a 2.4 micron pre-impactor. IS filters were considered to have captured all particle size in the ambient atmosphere, and all particles up to 2.5 microns in CAICE lab studies on the basis of similar sample line sizes and lengths as used for aerosol size distribution measurements.
3. NA: not available or not applicable
4. January 2013 data is for extremely high fluorescence conditions.
5. INP- and INP+ are values to be subtracted or added to give 95% confidence limit error bars.

Sample type	date	location	avg-lat	avg-lon	alt	Wind speed (ship)	Project	Volume	Temp	INP	INP-	INP+	CPC >10nm	sfc area	n _s
			deg	deg	m	m s ⁻¹		L	°C	L ⁻¹	L ⁻¹	L ⁻¹	cm ⁻³	μm ² cm ⁻³	cm ⁻²
IS-filter	Jul-20-2013 to July 21-2013	Eastern Pacific	31.3	-125.6	20	11.3	MAGIC	7595	-13.2	0.0006	0.00048	0.0026	245	12	4.96
IS-filter	Jul-20-2013 to July 21-2013	Eastern Pacific	31.3	-125.6	20	11.3	MAGIC	7595	-15.0	0.0006	0.00048	0.0026	245	12	4.96
IS-filter	Jul-20-2013 to July 21-2013	Eastern Pacific	31.3	-125.6	20	11.3	MAGIC	7595	-17.0	0.0025	0.0015	0.0037	245	12	20.88
IS-filter	Jul-20-2013 to July 21-2013	Eastern Pacific	31.3	-125.6	20	11.3	MAGIC	7595	-18.5	0.007	0.0033	0.0054	245	12	58.58
IS-filter	Jul-20-2013 to July 21-2013	Eastern Pacific	31.3	-125.6	20	11.3	MAGIC	7595	-20.0	0.012	0.0051	0.0072	245	12	102.62
IS-filter	Jul-20-2013 to July 21-2013	Eastern Pacific	31.3	-125.6	20	11.3	MAGIC	7595	-22.2	0.04	0.016	0.017	245	12	333.14
IS-filter	Jul-22-2013 to July 23-2013	Eastern Pacific	23.1	-151.7	20	6.9	MAGIC	8170	-17.0	0.00058	0.00047	0.0025	250	6	9.72
IS-filter	Jul-22-2013 to July 23-2013	Eastern Pacific	23.1	-151.7	20	6.9	MAGIC	8170	-18.5	0.0031	0.0018	0.0039	250	6	51.99
IS-filter	Jul-22-2013 to July 23-2013	Eastern Pacific	23.1	-151.7	20	6.9	MAGIC	8170	-20.0	0.0064	0.0031	0.0051	250	6	106.42
IS-filter	Jul-22-2013 to July 23-2013	Eastern Pacific	23.1	-151.7	20	6.9	MAGIC	8170	-20.0	0.0027	0.0017	0.0038	250	6	45.26

IS-filter	Jul-22-2013 to July 23-2013	Eastern Pacific	23.1	-151.7	20	6.9	MAGIC	8170	-22.2	0.0150	0.0060	0.0081	250	6	252.96
IS-filter	Jul-22-2013 to July 23-2013	Eastern Pacific	23.1	-151.7	20	6.9	MAGIC	8170	-22.2	0.0082	0.0037	0.0057	250	6	136.26
IS-filter	Jul-15-2011	Puerto Rico	18.27	-65.75	1060	NA	ICE-T	2610	-12.6	0.0010	0.0008	0.0045	300	80	1.22
IS-filter	Jul-15-2011	Puerto Rico	18.27	-65.75	1060	NA	ICE-T	2610	-16.1	0.0030	0.0021	0.0058	300	80	3.73
IS-filter	Jul-15-2011	Puerto Rico	18.27	-65.75	1060	NA	ICE-T	2610	-18.6	0.0096	0.0048	0.0084	300	80	12.02
IS-filter	Jul-15-2011	Puerto Rico	18.38	-65.62	60	NA	ICE-T	3480	-13.9	0.0015	0.0011	0.0039	300	80	1.85
IS-filter	Jul-15-2011	Puerto Rico	18.38	-65.62	60	NA	ICE-T	3480	-15.9	0.0063	0.0027	0.0072	300	80	7.91
IS-filter	Jul-15-2011	Puerto Rico	18.38	-65.62	60	NA	ICE-T	3480	-18.3	0.0271	0.0095	0.0123	300	80	33.86
IS-filter	Jul-17-2011	Puerto Rico	18.38	-65.62	60	NA	ICE-T	3480	-12.6	0.0007	0.0006	0.0034	450	80	0.91
IS-filter	Jul-17-2011	Puerto Rico	18.38	-65.62	60	NA	ICE-T	3480	-14.4	0.0015	0.0011	0.0039	450	80	1.85
IS-filter	Jul-17-2011	Puerto Rico	18.38	-65.62	60	NA	ICE-T	3480	-16.7	0.0015	0.0011	0.0039	450	80	1.85
IS-filter	Jul-17-2011	Puerto Rico	18.38	-65.62	60	NA	ICE-T	3480	-18.3	0.0063	0.0033	0.0060	450	80	7.91
IS-filter	Jul-23-2011	C-130 aircraft	17.5	-64.5	400	NA	ICE-T	460	-14.0	0.015	0.0092	0.0228	300	70	21.62
IS-filter	Jul-23-2011	C-130 aircraft	17.5	-64.5	400	NA	ICE-T	460	-16.0	0.015	0.0092	0.0228	300	70	21.62
IS-filter	Jul-23-2011	C-130 aircraft	17.5	-64.5	400	NA	ICE-T	460	-18.0	0.055	0.0232	0.0370	300	70	78.47
IS-filter	Jul-23-2011	C-130 aircraft	17.5	-64.5	400	NA	ICE-T	460	-20.0	0.065	0.0264	0.0401	300	70	93.09
IS-filter	Jul-23-2011	C-130 aircraft	17.5	-64.5	400	NA	ICE-T	460	-21.0	0.100	0.0365	0.0496	300	70	142.95
IS-filter	Jul-23-2011	C-130 aircraft	17.5	-64.5	400	NA	ICE-T	460	-22.0	0.121	0.0417	0.0549	300	70	172.21
IS-filter	Jul-23-2011	C-130 aircraft	17.5	-64.5	400	NA	ICE-T	460	-23.0	0.241	0.0762	0.0888	300	70	344.42
IS-filter	Jul-23-2011	C-130 aircraft	17.5	-64.5	400	NA	ICE-T	460	-24.0	0.335	0.1077	0.1205	300	70	478.33
IS-filter	Jul-22-2011 to Jul-24-2011	Puerto Rico	18.38	-65.62	60	NA	ICE-T	220000	-6.0	0.000018	0.000014	0.000077	300	60	0.03
IS-filter	Jul-22-2011 to Jul-24-2011	Puerto Rico	18.38	-65.62	60	NA	ICE-T	220000	-7.0	0.000036	0.000025	0.000088	300	60	0.06

IS-filter	Jul-22-2011 to Jul-24-2011	Puerto Rico	18.38	-65.62	60	NA	ICE-T	220000	-8.0	0.000095	0.000055	0.000119	300	60	0.16
IS-filter	Jul-22-2011 to Jul-24-2011	Puerto Rico	18.38	-65.62	60	NA	ICE-T	220000	-8.7	0.00018	0.00009	0.000152	300	60	0.31
IS-filter	Jul-22-2011 to Jul-24-2011	Puerto Rico	18.38	-65.62	60	NA	ICE-T	220000	-12.9	0.00032	0.00014	0.000199	300	60	0.53
IS-filter	Jul-22-2011 to Jul-24-2011	Puerto Rico	18.38	-65.62	60	NA	ICE-T	220000	-13.7	0.00040	0.00016	0.000228	300	60	0.67
CFDC	Nov-1-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-25.2	0.62	0.57	0.57	30	30	2063.22
CFDC	Nov-1-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-25.2	0.39	0.46	0.46	30	30	1312.01
CFDC	Nov-1-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-30.4	1.99	1.03	1.03	30	30	6625.90
CFDC	Nov-1-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-30.2	3.83	1.43	1.43	30	30	12759.90
CFDC	Nov-1-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-30.1	5.14	1.66	1.66	30	30	17120.00
CFDC	Nov-1-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-29.9	4.60	1.57	1.57	30	30	15340.63
CFDC	Nov-1-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-29.9	2.23	1.09	1.09	30	30	7417.32
CFDC	Nov-1-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-32.1	7.50	2.00	2.00	30	30	25001.68
CFDC	Nov-1-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-32.6	12.94	2.63	2.63	30	30	43129.18
CFDC	Nov-1-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-32.3	5.99	1.79	1.79	30	30	19981.36
CFDC	Nov-1-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-32.3	7.17	1.96	1.96	30	30	23905.30
CFDC	Nov-1-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-31.8	5.99	1.79	1.79	30	30	19972.75
CFDC	Nov-1-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-32.0	5.38	1.69	1.69	30	30	17937.68
MOUDI-DFT	Nov-7-2011 to Nov-8-2011	CAICE	NA	NA	NA	NA	Wave	28546	-25.0	0.26	0.18	0.18	175	275	96.16
MOUDI-DFT	Nov-7-2011 to Nov-8-2011	CAICE	NA	NA	NA	NA	Wave	28546	-28.0	0.31	0.18	0.18	175	275	111.51
MOUDI-DFT	Nov-7-2011 to Nov-8-2011	CAICE	NA	NA	NA	NA	Wave	28546	-30.0	2.46	1.30	1.30	175	275	895.50
MOUDI-DFT	Nov-7-2011 to Nov-8-2011	CAICE	NA	NA	NA	NA	Wave	28546	-33.0	6.60	3.37	3.37	175	275	2400.01
IS-filter	Nov-8-2011	CAICE	NA	NA	NA	NA	Wave	10500	-14.6	0.0003	0.0003	0.0014	150	152	0.18

IS-filter	Nov-8-2011	CAICE	NA	NA	NA	NA	Wave	10500	-18.5	0.0022	0.0021	0.0056	150	152	1.45
CFDC	Nov-8-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-30.0	2.44	1.14	1.14	150	152	1607.93
CFDC	Nov-8-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-29.9	2.70	1.20	1.20	150	152	1773.77
CFDC	Nov-8-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-32.8	8.05	2.07	2.07	150	152	5298.37
CFDC	Nov-8-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-32.8	6.15	1.81	1.81	150	152	4049.11
CFDC	Nov-8-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-32.8	6.81	1.91	1.91	150	152	4479.23
CFDC	Nov-8-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-32.9	4.62	1.57	1.57	150	152	3039.69
CFDC	Nov-8-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-32.9	4.33	1.52	1.52	150	152	2848.05
CFDC	Nov-8-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-32.6	4.30	1.51	1.51	150	152	2829.16
MOUDI-DFT	Nov-10-2011 to Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	27168	-18.0	0.04	0.03	0.03	175	275	12.87
MOUDI-DFT	Nov-10-2011 to Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	27168	-20.0	0.07	0.05	0.05	175	275	26.94
MOUDI-DFT	Nov-10-2011 to Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	27168	-25.0	0.19	0.10	0.10	175	275	70.22
MOUDI-DFT	Nov-10-2011 to Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	27168	-28.0	0.31	0.15	0.15	175	275	111.55
MOUDI-DFT	Nov-10-2011 to Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	27168	-30.0	1.59	0.55	0.55	175	275	578.62
MOUDI-DFT	Nov-10-2011 to Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	27168	-33.0	4.30	1.33	1.33	175	275	1565.10
IS-filter	Nov-10-2011 to Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	7360	-14.0	0.0009	0.0006	0.0014	175	152	0.62
IS-filter	Nov-10-2011 to Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	7360	-16.0	0.0017	0.0009	0.0017	175	152	1.13
IS-filter	Nov-10-2011 to Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	7360	-18.0	0.0090	0.0030	0.0039	175	152	5.91
IS-filter	Nov-10-2011 to Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	7360	-20.0	0.0270	0.0093	0.0100	175	152	17.77

IS-filter	Nov-10-2011 to Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	7360	-21.0	0.0301	0.0108	0.0119	175	152	19.83
CFDC	Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-30.5	0.91	0.70	0.70	150	152	597.74
CFDC	Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-29.9	0.83	0.66	0.66	150	152	544.61
CFDC	Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-29.9	0.53	0.53	0.53	150	152	350.49
CFDC	Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-33.0	1.39	0.86	0.86	150	152	912.23
CFDC	Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-32.8	2.34	1.12	1.12	150	152	1542.07
CFDC	Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-33.0	2.97	1.26	1.26	150	152	1954.51
CFDC	Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-33.0	2.05	1.05	1.05	150	152	1348.99
CFDC	Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-33.0	1.21	0.80	0.80	150	152	798.93
CFDC	Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-33.2	2.48	1.15	1.15	150	152	1633.23
CFDC	Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-32.7	2.50	1.15	1.15	150	152	1645.33
CFDC	Nov-11-2011	CAICE	NA	NA	NA	NA	Wave	7.5	-30.1	1.49	0.89	0.89	150	152	978.64
CFDC	Jan-27-2013	CAICE	NA	NA	NA	NA	MART	10	-26.0	170	82.46	82.46	550	500	34000.00
CFDC	Jan-27-2013	CAICE	NA	NA	NA	NA	MART	10	-28.0	480	138.56	138.56	550	500	96000.00
CFDC	Jan-27-2013	CAICE	NA	NA	NA	NA	MART	10	-28.0	900	189.74	189.74	550	500	180000.00
CFDC	Jan-27-2013	CAICE	NA	NA	NA	NA	MART	10	-30.0	1200	219.09	219.09	550	500	240000.00
CFDC	Jan-27-2013	CAICE	NA	NA	NA	NA	MART	10	-30.0	1500	244.95	244.95	550	500	300000.00
IS-filter	Jan-27-2013	CAICE	NA	NA	NA	NA	MART	565	-7.0	0.0049	0.0039	0.0214	550	500	0.98
IS-filter	Jan-27-2013	CAICE	NA	NA	NA	NA	MART	565	-9.0	0.0049	0.0039	0.0214	550	500	0.98
IS-filter	Jan-27-2013	CAICE	NA	NA	NA	NA	MART	565	-11.0	0.0207	0.0127	0.0305	550	500	4.14
IS-filter	Jan-27-2013	CAICE	NA	NA	NA	NA	MART	565	-13.0	0.0207	0.0127	0.0305	550	500	4.14
IS-filter	Jan-27-2013	CAICE	NA	NA	NA	NA	MART	565	-15.0	0.0207	0.0127	0.0305	550	500	4.14
IS-filter	Jan-27-2013	CAICE	NA	NA	NA	NA	MART	565	-17.0	0.0382	0.0203	0.0377	550	500	7.65
IS-filter	Jan-27-2013	CAICE	NA	NA	NA	NA	MART	565	-19.0	0.0652	0.0301	0.0470	550	500	13.05
IS-filter	Jan-27-2013	CAICE	NA	NA	NA	NA	MART	565	-21.0	0.2829	0.1073	0.1248	550	500	56.58
IS-filter	Jan-27-2013	CAICE	NA	NA	NA	NA	MART	565	-23.0	2.4448	0.9259	1.0735	550	500	488.97
CFDC	Jan-15-2014	CAICE	NA	NA	NA	NA	MART	15	-26.4	9.01	1.55	0.64	1000	930	969.33
CFDC	Jan-15-2014	CAICE	NA	NA	NA	NA	MART	15	-30.1	113.72	5.51	1.21	1000	930	12227.53

CFDC	Jan-15-2014	CAICE	NA	NA	NA	NA	MART	15	-22.3	0.09	0.09	0.16	1000	930	10.11
CFDC	Jan-15-2014	CAICE	NA	NA	NA	NA	MART	15	-23.4	1.22	0.57	0.39	1000	930	131.09
CFDC	Jan-15-2014	CAICE	NA	NA	NA	NA	MART	15	-26.6	11.11	1.72	0.68	1000	930	1194.21
CFDC	Jan-15-2014	CAICE	NA	NA	NA	NA	MART	15	-29.0	45.24	3.47	0.96	1000	930	4864.03
IS-filter	Jan-15-2014	CAICE	NA	NA	NA	NA	MART	415	-15.5	0.0064	0.0051	0.0280	1000	930	0.69
IS-filter	Jan-15-2014	CAICE	NA	NA	NA	NA	MART	415	-16.1	0.0064	0.0051	0.0280	1000	930	0.69
IS-filter	Jan-15-2014	CAICE	NA	NA	NA	NA	MART	415	-17.0	0.0064	0.0051	0.0280	1000	930	0.69
IS-filter	Jan-15-2014	CAICE	NA	NA	NA	NA	MART	415	-18.0	0.0131	0.0093	0.0319	1000	930	1.41
IS-filter	Jan-15-2014	CAICE	NA	NA	NA	NA	MART	415	-19.0	0.0201	0.0137	0.0354	1000	930	2.16
IS-filter	Jan-15-2014	CAICE	NA	NA	NA	NA	MART	415	-20.0	0.0611	0.0313	0.0537	1000	930	6.57
IS-filter	Jan-15-2014	CAICE	NA	NA	NA	NA	MART	415	-20.6	0.0923	0.0430	0.0658	1000	930	9.93
IS-filter	Jan-15-2014	CAICE	NA	NA	NA	NA	MART	415	-21.0	0.1044	0.0480	0.0708	1000	930	11.22
IS-filter	Jan-15-2014	CAICE	NA	NA	NA	NA	MART	415	-21.6	0.1044	0.0480	0.0708	1000	930	11.22
IS-filter	Jan-15-2014	CAICE	NA	NA	NA	NA	MART	415	-22.0	0.1655	0.0708	0.0935	1000	930	17.79
IS-filter	Jan-15-2014	CAICE	NA	NA	NA	NA	MART	415	-22.5	0.2988	0.1295	0.1523	1000	930	32.13
IS-filter	Jan-15-2014	CAICE	NA	NA	NA	NA	MART	415	-23.5	1.2998	0.7179	1.4013	1000	930	139.76
DFT	Jul-15-2014	Arctic	69.36	-64.85	20	2.9	NETCARE	200	Averages	below	-	-	-	-	-
DFT	Jul-16-2014	Arctic	71.7	-71.12	20	4.2	NETCARE	200	-22.5	0.0562	0.0460	0.1347	1800	14	401.34
DFT	Jul-26-2014	Arctic	73.93	-75.27	20	4.6	NETCARE	200	-25.0	0.0805	0.0700	0.1930	1800	14	575.31
DFT	Jul-28-2014	Arctic	73.26	-57.88	20	1.5	NETCARE	200	-27.5	0.4629	0.3529	0.8535	1800	14	3306.21
DFT	Jul-31-2014	Arctic	76.32	-73.27	20	3.5	NETCARE	200	Averages	above	-	-	-	-	-
IS-filter	Jul-27-2012 to July 28-2012	Bering Sea	62.57	173.7	20	6.1	SHIPPO	13556	-12.0	0.0002	0.0002	0.0011	500	16	1.55
IS-filter	Jul-27-2012 to July 28-2012	Bering Sea	62.57	173.7	20	6.1	SHIPPO	13556	-14.0	0.0031	0.0014	0.0023	500	16	19.20
IS-filter	Jul-27-2012 to July 28-2012	Bering Sea	62.57	173.7	20	6.1	SHIPPO	13556	-16.0	0.0041	0.0017	0.0026	500	16	25.44
IS-filter	Jul-27-2012 to July 28-2012	Bering Sea	62.57	173.7	20	6.1	SHIPPO	13556	-18.0	0.0130	0.0042	0.0051	500	16	81.04

IS-filter	Jul-27-2012 to July 28-2012	Bering Sea	62.57	173.7	20	6.1	SHIPPO	13556	-20.0	0.0227	0.0073	0.0082	500	16	142.02
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