

Observation of mass concentration and particle size of atmospheric aerosol in east Asia and dry deposition in Tsukuba in combination with optical particle counter observation

Yutaka Kanai^{1,2}, Atsuyuki Ohta², Hikari Kamioka¹, Noboru Imai², Hiroshi Shimizu^{3,2},
Yoshio Takahashi^{3,2}, Kenji Kai⁴, Masahiko Hayashi⁵ and Renjian Zhang⁶

Yutaka Kanai, Atsuyuki Ohta, Hikari Kamioka, Noboru Imai, Hiroshi Shimizu, Yoshio Takahashi, Kenji Kai, Masahiko Hayashi and Renjian Zhang (2005) Observation of mass concentration and particle size of atmospheric aerosol in east Asia and dry deposition in Tsukuba in combination with optical particle counter observation. *Bull. Geol. Surv. Japan*, vol. 56 (7/8), 273-301, 11 figs, 4 tables, 3 appendixes.

Abstract: Under the Japan-China joint project, "Studies on origin and transport of aeolian dust and its impact on climate (ADEC)", we have observed the aeolian dust in Beijing, Qingdao, and Hefei in China and Fukuoka, Nagoya, Tsukuba and Naha in Japan since the spring of 2001. The mass concentrations of total suspended particles (TSP) observed by the high-volume air sampler and size distribution observed by the low-volume air sampler were reported in this paper. In addition, the OPC observation in March 2004 and variation of dry deposition in Tsukuba were also reported. From the observation (2001-2004) of mass concentration of TSP we explained the seasonal and local variations. The dust concentration was generally high in spring and intensive observation periods (IOPs) were settled in spring each year. Some large dust events occurred during IOP-1 in April 2002 while dust storms were observed in IOP-2 (March 2003) and IOP-3 (March 2004). The particle size was a bimodal distribution that suggests natural and anthropogenic origins. When the dust storm occurred, the coarser particles increased. The optical particle counter (OPC) was used to understand the variations of size and number of aerosol particles in March 2004. The properties of aerosols varied hourly and it is shown that the OPC has much better time-resolution so it is very useful to observe the short-time variation of aerosols. The variation pattern of the flux of dry deposition in Tsukuba resembled roughly that of the TSP.

Keywords: aeolian dust, TSP, size distribution, dry deposition, OPC, Japan, east China

1. Introduction

"Kosa" is a well-known aeolian dust that is transported from the arid and semi-arid regions in China. The number of Asian dust storm phenomena in China is increasing recently because the arid and semi-arid area is spreading. These atmospheric aerosols have serious effects on human life, agriculture and traffic, and furthermore heavily impact the global climate such as the "greenhouse effect". However, it is not clear whether the dust may cause a positive or negative effect because it is not well understood which physico-chemical properties of dust particles bring about the effect. Therefore, precise observation data and a complex model are necessary to estimate its exact inter-

ence on the global climate.

Recently several projects have started to observe the global climate. We started the Japan-China joint project, "Studies on origin and transport of aeolian dust and its impact on climate (ADEC)", in 2000 in order to obtain precise observation data and make a quantitative prediction model for the estimation of climate change (Kanai, 2001; Mikami, *et al.*, 2002). In a related project, Ace-Asia project (Aerosol Characterization Experiment in Asian Region) was started in spring 2001 to increase our understanding of the effects of atmospheric aerosol particles on the earth's climate system (Ma *et al.*, 2004a, b; Topping *et al.*, 2004; Zhang *et al.*, 2004).

We have already reported some observation data and

¹ Research Center for Deep Geological Environments, GSJ, AIST, Central 7 1-1-1 Higashi, Tsukuba, Ibaraki, 305-8567, Japan.

² Institute of Geology and Geoinformation, GSJ, AIST, Central 7 1-1-1 Higashi, Tsukuba, Ibaraki, 305-8567, Japan.

³ Hiroshima University, 1-3-1 Kagamiyama, Higashi-Hiroshima, 739-8526, Japan.

⁴ Nagoya University, Furo-cho, Chikusa-ku, Nagoya, 464-8601, Japan.

⁵ Fukuoka University, 8-19-1 Nanakuma, Jonan-ku, Fukuoka, 814-0180, Japan.

⁶ Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing, 100029, P. R. China.

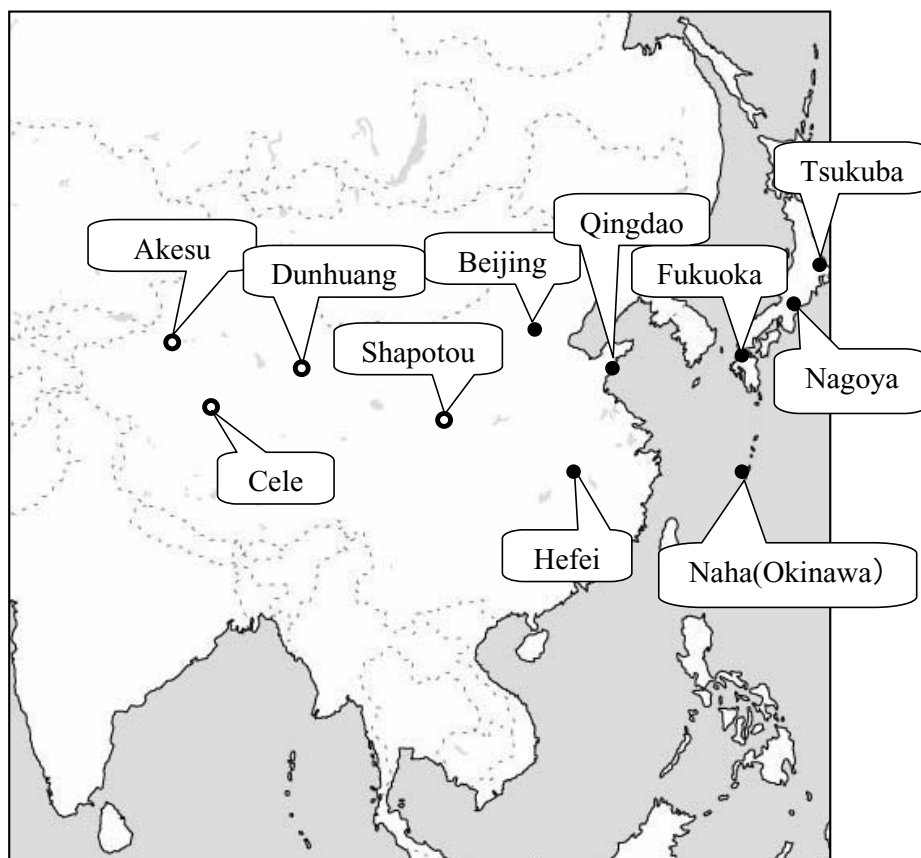


Fig. 1 Map of sampling localities. Solid circles represent seven observation stations for this study. Open circles are four observation stations by Yabuki *et al.* (2002).

knowledge obtained by geochemical research such as mineralogical and chemical analyses. They include; (1) the variations of dust collected in Japan and China (Kanai *et al.*, 2002a; 2002b; 2003; 2005; Ohta *et al.*, 2003), (2) the variation of chemical composition during transportation from China (Beijing) to Japan (Ohta *et al.*, 2004; 2005a), (3) the seasonal variation of mass concentration and chemical composition of aeolian dust (Kanai *et al.*, 2002a; 2003; 2005; Kamioka and Kanai, 2002; Ohta *et al.*, 2003; 2005b) and (4) properties of a dust event (Kanai *et al.*, 2003; 2005; Zhang *et al.*, 2002; 2003a, b; 2004; Ohta *et al.*, 2005c).

In this paper, we present the overall observation data obtained until May 2005 in order to construct a better model using this data. Our data will be very useful and valuable because they are collected from 2001 to 2005 under the ADEC project at strategic observation stations, *i.e.*, in Beijing, Qingdao and Hefei in China and Naha, Fukuoka, Nagoya and Tsukuba in Japan. They are situated along the route of westerly winds. A part of our data was already used to construct and evaluate some models (Shao *et al.*, 2003; Han *et al.*, 2004). In addition to the observation data by air samplers, some observation data by the optical particle counter (OPC) in Tsukuba are reported to explain short-time varia-

tions. The four-year observation data of dry deposition is also reported in this paper.

2. Sampling locations and instruments

Sampling locations and sampling methods of aeolian dust are already written in other papers (Kanai *et al.*, 2002a; 2003; 2005). The network observation sites are three stations in eastern China (Qingdao, Beijing and Hefei), four stations in Japan (Naha, Fukuoka, Nagoya and Tsukuba). Figure 1 shows the aeolian dust sampling localities in China and Japan (see Table 1 for details).

A high-volume air sampler (HV-1000F; manufactured by Shibata Scientific Technology Ltd.) was employed for determining the mass concentration of total suspended particle (TSP) in the air. The flow rate was maintained at 1000 l/min, and a polyflon filter (PF040, 25 x 20 cm; manufactured by Advantec MFS Inc.) was used for collection of dust. A low-volume Andersen-type air sampler (AN-200; manufactured by Shibata Scientific Technology Ltd.) was used to obtain size distribution data. The flow rate was 28.3 l/min to induce the ideal particle size classification by aerodynamic diameter; >11.0 μm (sampling stage 0), 11.0–7.0 μm (stage 1), 7.0–4.7 μm (stage 2), 4.7–3.3 μm

Table 1 List of seven observation stations.

Observation station	Location name	Latitude (N)	Longitude (E)	Elevation above S.L. (m)
Tsukuba	Geological Survey of Japan	36.06	140.14	44
Nagoya	Nagoya University	35.15	136.96	74
Fukuoka	Fukuoka University	33.55	130.37	57
Naha	Okinawa branch of the Japan Weather Association	26.20	127.69	40
Beijing	Institute of Atmospheric Physics	39.93	116.35	100
Qingdao	Ocean University of China	36.07	120.33	80
Hefei	Anhui Institute of Optics and Fine Mechanics	31.90	117.16	52

(stage 3), 3.3-2.1 μm (stage 4), 2.1-1.1 μm (stage 5), 1.1-0.65 μm (stage 6), 0.65-0.43 μm (stage 7) and <0.43 μm (backup filter). The filters used for stages 0 to 6 were polyflon filters of 80 mm in diameter (PF050; manufactured by Advantec MFS Inc.). Those for stage 7 and the backup filter were quartz filters (2500QAT-UP; manufactured by Tokyo Dylec Co. Ltd.). The operation time varied from several hours to 20 days depending on the situation and location.

The OPC is one of the instruments for measuring particle size. The details of general instruments of "light scattering automatic particle counter" are described in the JIS B9921 document. The OPC in this study was made by Yamanashi Gijutsu Kobo Co. Ltd.. A laser light source (67 mW) is collimated to illuminate aerosol flowing out of a nozzle at about 100 ml/min. A photodetector, 60 degrees off-axis from the light beam, measures the amount of light scattered from a single particle. Both the size and number of particles are measured simultaneously. This OPC instrument has eight channels, which correspond to the >0.3 μm , >0.5 μm , >0.7 μm , >1 μm , >2 μm , >3 μm , >5 μm and >7 μm particle diameter ranges. The OPC instrument was beside the air samplers (on the rooftop of C-8 building, Geological Survey of Japan, Tsukuba Central 7; see Table 1 for details) and operated in March 2004.

The instrument for dry deposition observation was manufactured by Shibata Scientific Technology Ltd.. It

has a movable roof with a sensor that is open except during rain. The duration time for keeping the roof open is accumulated and recorded. The sampling box size is 178 (L) x 228 (W) x 250 (H) mm. The collection area is 400 cm^2 . The instrument was operated from 2001 to 2004.

3. Results and discussion

3.1 Mass concentrations of TSP in Japan and east China

The mass concentrations of TSP in the air were obtained by a high-volume air sampler. We first set up the instruments in Qingdao in China and Naha, Fukuoka, Nagoya and Tsukuba in Japan in 2001. Additional sampling instruments were prepared in Beijing and Hefei in 2002, which enabled us to establish a much better system for systematic observation. Therefore the observation of aeolian dust particles started from February 2001 in Tsukuba and Naha, March 2001 in Nagoya, April 2001 in Fukuoka, May 2001 in Qingdao, and March 2002 in Beijing and Hefei. The observation data in eastern China (Qingdao, Beijing and Hefei) and in Japan (Naha, Fukuoka, Nagoya and Tsukuba) until 2003 are reported in previous papers (Kanai *et al.*, 2002a; 2003; 2005). All the observation data including those after 2003 are shown in Appendix 1 tables. The completion dates of observation are different for each observation site. The observation in Tsukuba and

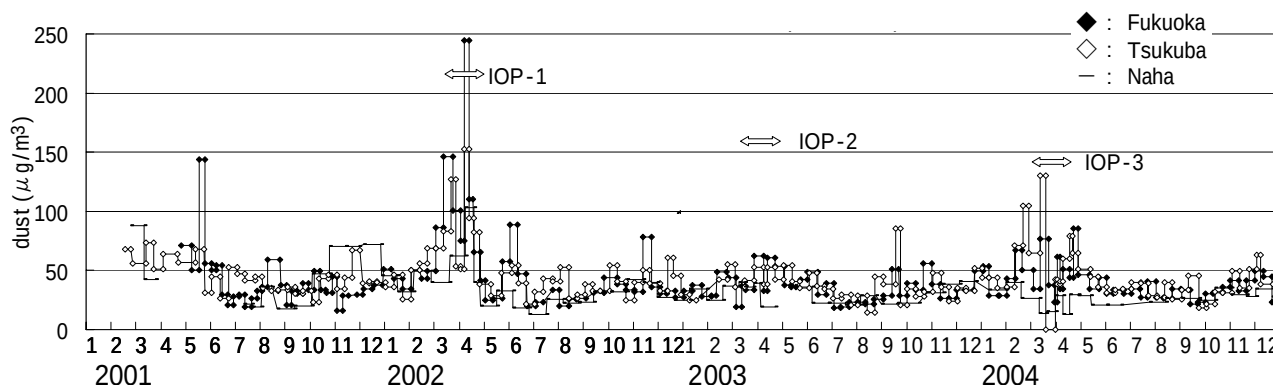


Fig.2 Mass concentrations of TSP observed in Fukuoka, Tsukuba and Naha from 2001 to 2004.

Fukuoka continued until May 2005. Figure 2 shows the four-year variations (2001-2004) of mass concentrations of TSP observed in Fukuoka, Tsukuba and Naha.

During the ADEC project, the intensive observation periods (IOPs) were each spring (IOP-1: April 2002, IOP-2: March 2003, IOP-3: March 2004). In Fig. 2, the periods of IOPs are also shown. It was noticed that the mass concentrations of TSP during IOP-1 are the highest while those during IOP-2 are the lowest. The reason is because the ground conditions in China were different each year. It is assumed that the soil was wet

and dust particles were difficult to be airborne in 2003. In order to confirm the differences of dust amount observed at seven stations, the time-weighted average daily mass concentration of TSP during March and April is shown in Table 2 and Fig. 3. This is not the average mass flux, but the average concentration per day because the wind flow is neglected. From Table 2, it is obvious that the average concentration of TSP in March and April 2002 is the highest and that in 2003 is the lowest except in Naha. In 2004, those in Beijing, Fukuoka and Tsukuba are higher than those in 2003.

This result is supported by the number of "Kosa" days in Japan. The total number of the observed points and days is 803 point-days in 2001, 1183 point-days in 2002, 169 point-days in 2003 and 497 point-days in 2004 (Japan Meteorological Agency, 2005).

In the spring of 2002, two typical dust events were observed in China and Japan; on 20 March and 8 April. Figure 4 shows the variation of mass concentrations of TSP at our observation stations. The strong dust event brought the aerosol for a short time and the concentration increased rapidly. In Beijing, the mass concentration of TSP was 367 $\mu\text{g}/\text{m}^3$ until 1045 CST (20 March), increased to 11.6 mg/m^3 for 6 hrs, decreased to 3 mg/m^3 on the next day (21 March) and finally decreased to 1.5 mg/m^3 (22 March). The concentration in Beijing was very high during the

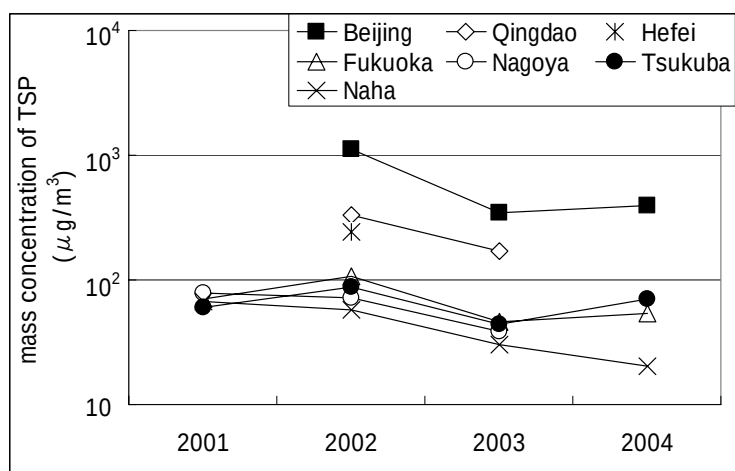


Fig.3 Average daily mass concentrations of TSP during March and April each year at seven observation stations.

Table 2 Average daily mass concentrations of TSP during March and April each year at seven stations.

year	observation station						
	Beijing	Qingdao	Hefei	Fukuoka	Nagoya	Tsukuba	Naha
2001				24 Apr. - 7 May 70.8	15 Mar. - 24 Apr. 77.5	26 Feb. - 24 Apr. 60.7	9 Mar. - 23 Mar. 66.5
2002	1 Mar. - 22 Apr. 1121	2 Mar. - 19 Apr. 332	15 Mar. - 19 Apr. 243	1 Mar. - 1 May 107.7	25 Feb. - 25 Apr. 72.0	1 Mar. - 24 Apr. 88.1	26 Feb. - 24 Apr. 58.0
2003	7 Mar. - 23 Apr. 344	17 Mar. - 28 Apr. 170		4 Mar. - 2 May 46.4	28 Feb. - 11 Apr. 38.2	3 Mar. - 1 May 44.4	7 Mar. - 21 Apr. 30.3
2004	8 Mar. - 25 Apr. 399*			2 Mar. - 26 Apr. 53.9		27 Feb. - 26 Apr. 70.0	9 Mar. - 26 Apr. 20.2

* : calculated from the data obtained by low-volume air sampler

unit : $\mu\text{g}/\text{m}^3$

event, while those in Japan were lower by an order of magnitude than in Beijing. The suspended particles were dispersed and fell out during the transport to Japan. As a result, the dust concentration is observed as "the average concentration" for several days in Japan while it is "real-time" concentration for a short period in China. The detailed climatic analysis for these dust episodes was reported by Zhang *et al.* (2002; 2004), Lee *et al.* (2004) and Guo *et al.* (2004). The same decreasing trend of dust from China to Japan is also reported in the dust episode in 2001 (Mori *et al.*, 2003).

3.2 Size distribution of aeolian dust

The low-volume air sampler was at the same observation station as the high-volume air sampler. The observation data are shown in the Appendix 2 tables. As shown in previous papers (Kanai *et al.*, 2002a; 2003; 2005), the size of aeolian dust is a bimodal distribution. It is well known that the particulate matters have two origins; natural and anthropogenic (Wilson and Suh, 1997). One peak around $0.5\ \mu\text{m}$ corresponds to anthropogenic aerosol consisting mainly carbon particles and another peak around $4\text{--}5\ \mu\text{m}$ contains aeolian dust particles, *i.e.* mineral particles probably transported from China. The typical result of the aerosol size distribution in Tsukuba in 2004 is shown in Fig. 5. The bimodal distribution in spring is more obvious than other seasons. It is also shown that the coarser particles increase in spring [*i.e.*, (2)–(4) in Fig. 5], when dust storm often occurs. Therefore the variation of size distribution is larger in 2002 than in 2001, 2003 and 2004, which indicates many dust events were observed in 2002. The concentration of the finer fraction, which is assumed to be of anthropogenic origin, increased in winter and fall [for example, (1), (7) and (8) in Fig. 5]. This increase may be due to the combustion of fuels. In Qingdao, the finer fraction sometimes increased in winter (Kanai *et al.*, 2003; 2005), and it is assumed that the release of carbon increased by the use of coal. Streets *et al.* (2001) estimates that a quarter of the global carbon output is from China. Decesari *et al.* (2001) also reports that the total carbon content in the aerosol is low in summer and high in winter in Italy.

3.3 OPC data

The size distribution by the low-volume air sampler shown in Section 3.2 is obtained by measuring the weight of size-segregated fraction. Several μg s are necessary for stable measurement by a balance. This means that the usual sampling period ranges from sev-

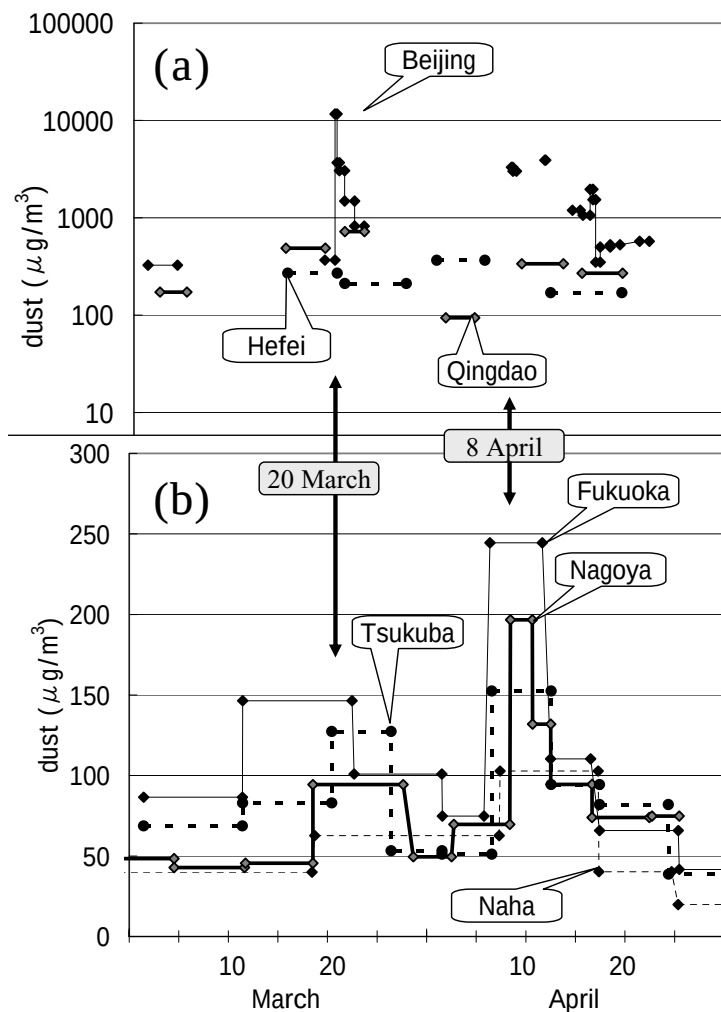


Fig. 4 Mass concentrations of TSP during March and April 2002 in (a) east China and (b) Japan.

Typical dust events were observed on 20 March and 8 April 2002.

eral days to twenty days depending on the aerosol concentration, place, time and circumstance (Kanai *et al.*, 2002a; 2003). Therefore the size distribution obtained by the low-volume air sampler is the average for a sampling period and obtaining a short-time variation is difficult for the sampler.

Since the OPC instrument measures both the number and size of particles simultaneously and the interval of data acquisition is 1 second, the time resolution of OPC is much better than the low-volume air sampler. The size-segregated number is obtained by subtracting each channel data to obtain the $0.3\text{--}0.5\ \mu\text{m}$, $0.5\text{--}0.7\ \mu\text{m}$, $0.7\text{--}1\ \mu\text{m}$, $1\text{--}2\ \mu\text{m}$, $2\text{--}3\ \mu\text{m}$, $3\text{--}5\ \mu\text{m}$, $5\text{--}7\ \mu\text{m}$ and $>7\ \mu\text{m}$ ranges. Figure 6 shows a typical curve of the particle number concentration. The OPC data is the number of particles, not the mass weight, so it cannot be compared directly with that by air sampler. However assuming that the particles are spherical and the mass density is 2.65, the mass distribution can be

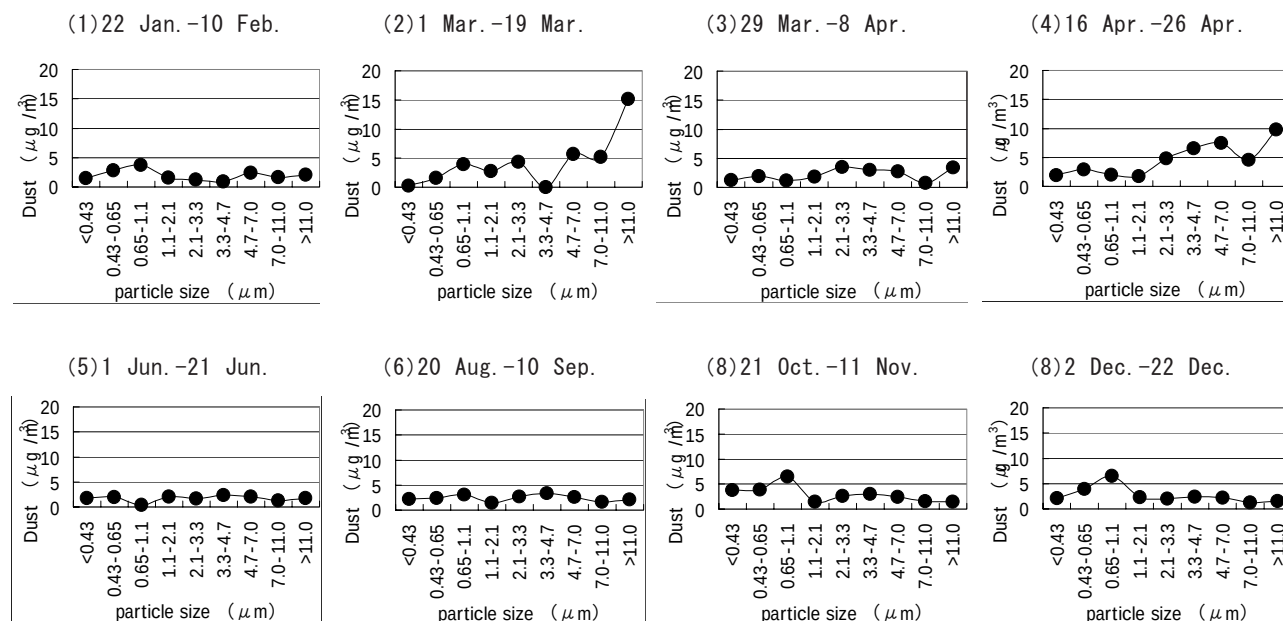


Fig.5 Concentration of aeolian dust against particle size obtained by using a low-volume air sampler in Tsukuba in 2004.

obtained. Although the size classification of OPC is a little different from that of the low-volume air sampler, each fractional count per cubic meter was calculated using 12hr-data. The observed hourly data is shown in the Appendix 3 table.

Using the difference of number (n) or mass (m) and classification diameter (d), $\delta n / \delta \log d$ and $\delta m / \delta \log d$ were calculated by assuming a spherical particle with a mass density of 2.65. A typical distribution observed on 31 March is shown in Fig. 7. It shows a bimodal

distribution; one peak around 2.5 μm and the other less than 1 μm . These peaks may correspond to the natural and anthropogenic origins as shown in Section 3.2. The number of coarser particles was low before noon and high in the afternoon.

The air sampler data and OPC data obtained from 19 March to 29 March and from 29 March to 8 April (OPC data are until 1 April) are compared. The OPC data are averaged during these periods. Figure 8 shows both distributions by the air sampler and OPC that were calculated in the same way. It seems that the value by the OPC is higher than that by the air sampler and the peak diameter by the OPC is smaller than by the air sampler. This may be the result of the real dust particle is not spherical and its density is lower. Organic materials, sea salts and light mineral materials might make discrepancies between the instruments.

The sum of the particles with a 0.3-1 μm diameter and those larger than 1 μm diameter are assumed to be the anthropogenic dust and mineral dust, respectively. The hourly variations of fractional and total mass concentrations from 19 March to 1 April are shown in Fig. 9. The dust concentrations vary largely with time. Mass concentration of larger particles is sometimes higher (on 19 March, 31 March - 1 April in Fig. 9) than that of smaller particles during the observation period. Rainy days are also indicated in the figure, and it seems that the mass concentration of larger particles was lower when it rained. This decrease is the result of the "wash out" effect by rain. Although the

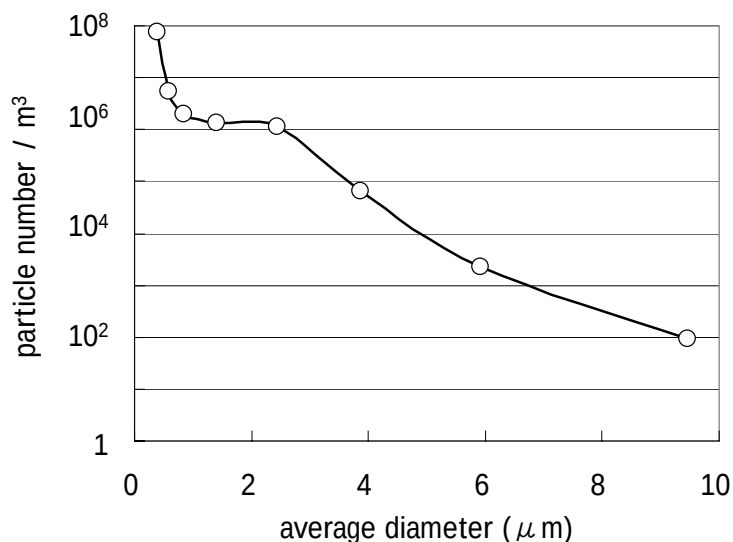


Fig.6 A typical curve of particle number against average diameter obtained by the OPC.

The observation period is from 1200 JST to 2359 JST, 31 March 2004.

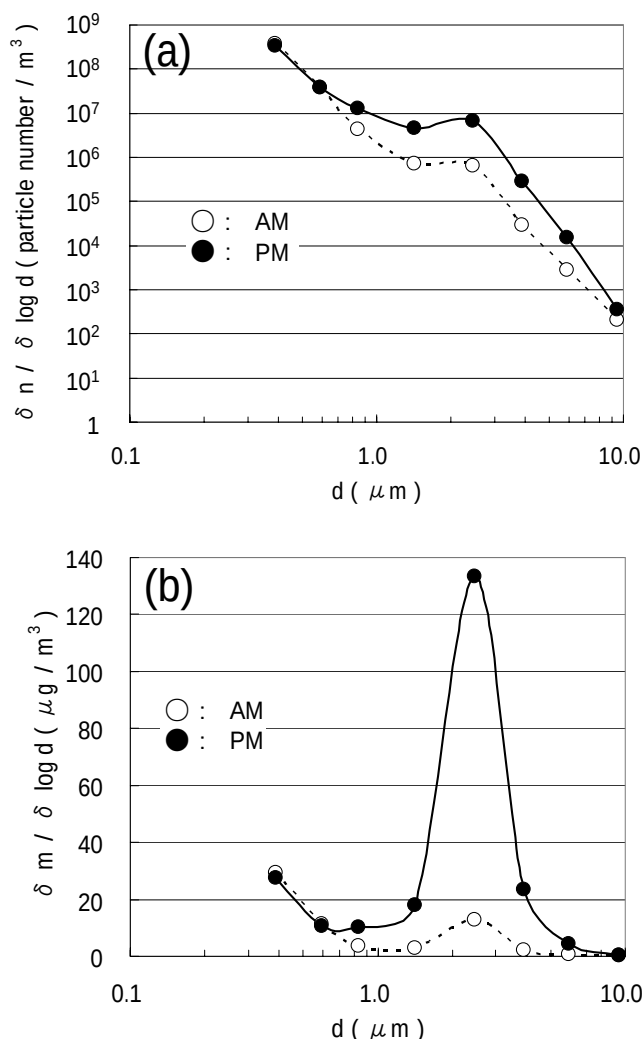


Fig.7 A typical curve of (a) $\delta n / \delta \log d$ and (b) $\delta m / \delta \log d$ against particle diameter.
It was observed on 31 March 2004 in Tsukuba.

wind velocity and direction may effect on the dust properties, there was no apparent relation with the observed variation that was detected. The local weather along with an air mass that covers a larger area might control the particle distribution properties.

Semidiurnal variation of the size classified particle number is shown in Fig.10. Table 3 shows their relative standard deviation during 19 March - 1 April 2004. The fact that the standard deviation of the coarser particles is larger than that of finer ones suggests that the amount of coarser aeolian dust varies easily with climatic conditions. The rapid increase of dust concentration was inferred from the observation on 20 March in Beijing (see Section 3.1).

In conclusion, the large variation of dust concentrations observed by the OPC indicates that the OPC is extremely sensitive and has excellent time-resolution so it is very useful to observe short-time variation of aerosols.

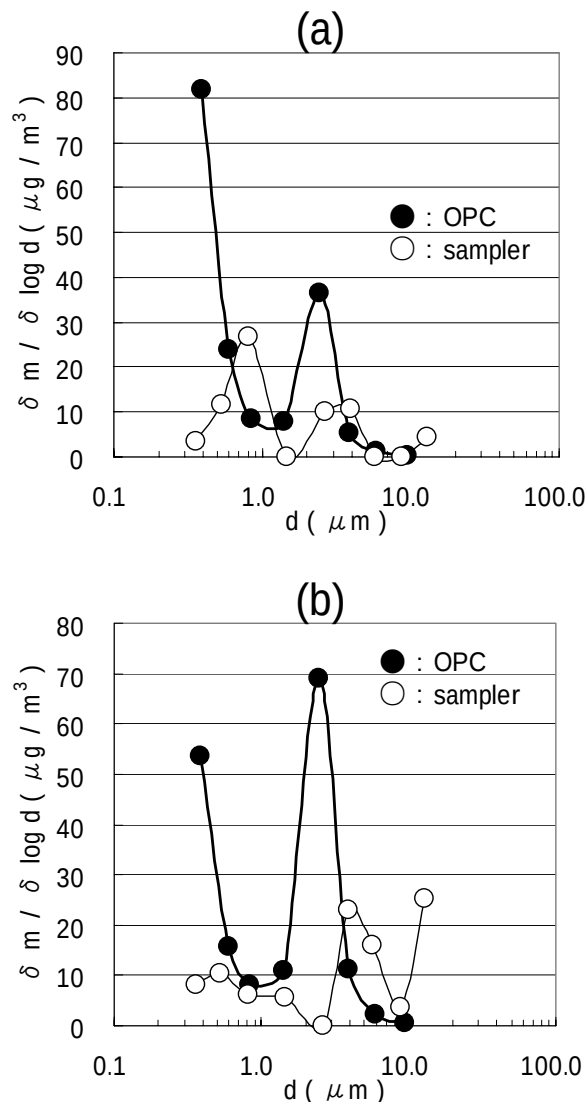


Fig.8 Comparison of size distributions determined by a low-volume air sampler and OPC.
(a) Observed on 19 - 29 March 2004.
(b) Observed on 29 March - 1 April (OPC) and 8 April (sampler) 2004.

3.4 Variation of dry deposition in Tsukuba

From the spring of 2001, the dry deposition was collected in Tsukuba. The results are shown in Table 4. The flux of dry deposition ranges from 0.02 to 0.14 $\text{g}/\text{m}^2/\text{d}$. The high flux was observed each spring except in 2003 when few large dust storms were observed. There are two types of deposition; dry and wet. Dry deposition is the mass of dust that is transported by wind and deposited. On the other hand, wet deposition is the mass of dust that is deposited with rain. The flux of dry deposition seems to be in a linear relation with the atmospheric mass concentration of TSP because it depends on the atmospheric concentration and deposition rate. Figure 11 shows the mass concentration of TSP

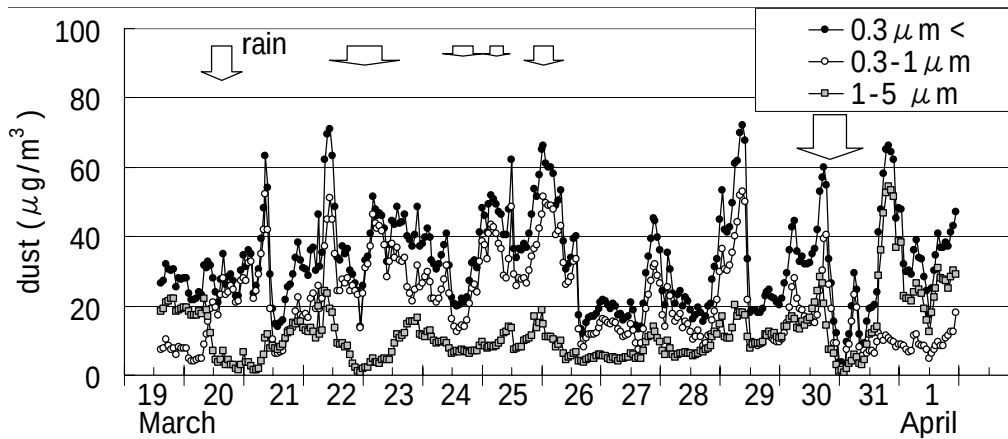


Fig.9 Hourly fractional and total mass concentrations observed by the OPC in Tsukuba in 2004 .

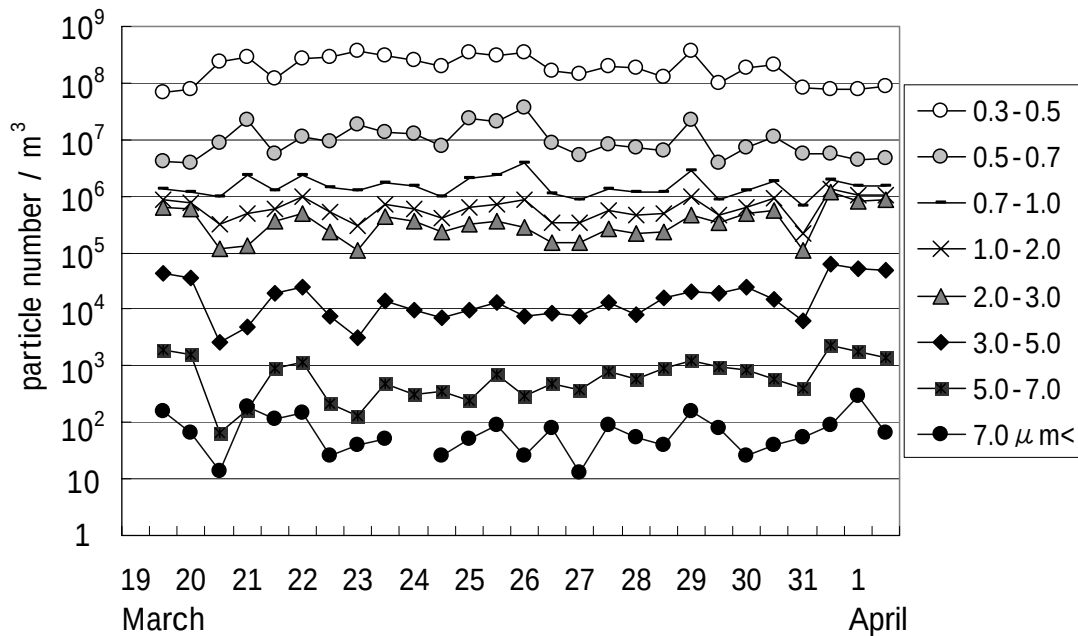


Fig.10 Semidiurnal variation of the size-classified particle number in Tsukuba in 2004.

Table 3 Relative standard deviation (RSD) of size-classified particle number from 19 March to 1 April 2004.

size range (μm)	RSD (%)
0.3-0.5	50
0.5-0.7	72
0.7-1.0	46
1.0-2.0	43
2.0-3.0	66
3.0-5.0	87
5.0-7.0	76
7.0<	83

and flux of dry deposition in Tsukuba from 2001 to 2004. The trend of the mass concentration of TSP roughly resembles that of the flux of dry deposition. The average flux of dry deposition in Tsukuba during 2001-2004 was $0.066 \text{ g/m}^2/\text{d}$ while that in Qingdao, China is reported to be $0.06\text{-}0.2 \text{ g/m}^2/\text{d}$ during May 2001 to November 2002 with a mean value of $0.13 \text{ g/m}^2/\text{d}$ (Zhang *et al.*, 2004), which is higher than that in Tsukuba.

4. Conclusion

The authors have observed the aeolian dust in Beijing, Qingdao, and Hefei in China and Fukuoka,

Table 4 Flux of dry deposition in Tsukuba.

No.	start		end		total hour	flux of dry deposition
	date	time	date	time	hour	g/m ² /d
1	30-Mar-01	18:16	~ 07-May-01	11:48	618	0.143
2	07-May-01	11:58	~ 04-Jul-01	15:40	924	0.036
3	04-Jul-01	18:30	~ 01-Oct-01	10:55	1676	0.057
4	03-Oct-01	15:13	~ 04-Dec-01	14:45	1000	0.049
5	04-Dec-01	15:00	~ 01-Mar-02	14:55	1674	0.049
6	01-Mar-02	15:29	~ 01-Apr-02	14:58	577	0.143
7	01-Apr-02	15:07	~ 10-Jun-02	13:31	1267	0.067
8	10-Jun-02	13:55	~ 01-Aug-02	15:09	766	0.137
9	01-Aug-02	15:30	~ 05-Nov-02	11:28	1071	0.056
10	05-Nov-02	11:55	~ 27-Dec-02	15:10	746	0.028
11	27-Dec-02	15:20	~ -	-	-	-
12	03-Feb-03	17:21	~ 03-Apr-03	13:13	1016	0.060
13	03-Apr-03	13:13	~ 02-Jun-03	13:38	800	0.054
14	02-Jun-03	13:43	~ 07-Aug-03	16:30	863	0.051
15	07-Aug-03	16:35	~ 30-Sep-03	13:42	604	0.099
16	30-Sep-03	13:55	~ 02-Dec-03	9:48	877	0.021
17	02-Dec-03	10:00	~ 20-Feb-04	10:50	1555	0.051
18	20-Feb-04	10:55	~ 08-Apr-04	16:25	915	0.103
19	08-Apr-04	16:30	~ 15-Jun-04	11:08	1148	0.057
20	15-Jun-04	11:13	~ 02-Aug-04	10:42	981	0.032
21	02-Aug-04	10:46	~ 01-Oct-04	16:10	1124	0.029
22	01-Oct-04	16:20	~ 31-Dec-04	10:00	1401	0.056

Nagoya, Tsukuba and Naha in Japan since the spring of 2001. The mass concentrations of TSP observed by a high-volume air sampler and size distribution observed by a low-volume air sampler were reported. In addition, the OPC observation in 2004 and dry deposition observation were achieved in Tsukuba.

(1) From the TSP observation, we obtained the seasonal and local variations in the ADEC project. The dust concentration was generally high in spring, and IOPs were in the spring each year. Some large dust events occurred in IOP-1. However, few dust storms were observed in IOP-2 and IOP-3. The dust sampling was conducted, and the mineralogical and geochemical properties of aeolian dust were determined (Kanai *et al.*, 2003; 2005).

(2) Size distribution was the same as that in previous papers (Kanai *et al.*, 2002; 2003; 2005). It shows a bimodal distribution that suggests two origins, *i.e.*, natural and anthropogenic. When a dust storm occurred, coarser particles increased. The sampling of size-segregated particles was also carried out, and the geochemical properties of dust were determined (Kanai *et al.*, 2003; 2005; Kamioka and Kanai, 2002; Ohta *et al.*, 2003; 2005b).

(3) The OPC instrument was used to understand short-time variations of size distribution and particle number. Hourly variation in March 2004 was observed and revealed that the dust concentrations vary largely

with time, and the mass concentration of larger particles is lower when it rains. The variation of coarser particles is larger than that of finer particles. It is shown that the OPC has much time-resolution property so it is very useful to observe the short-time variation of aerosols.

(4) Dry deposition was observed in Tsukuba during 2001-2004 and its variation pattern resembled roughly that of the TSP. The average flux was lower than that in Qingdao, China.

Acknowledgements: The authors would like to thank S. Terashima and Y. Matsuhisa of the AIST for promoting the project. We also thank M. Kanai, M. Bros of the AIST, L. Sheng of Ocean University of China and many students of Nagoya University, Hiroshima University and Fukuoka University for their assistance for the measurements and observations. We also acknowledge S. Yabuki and Y. Yamada of RIKEN for information on the OPC, and I. Isobe and A. Suzuki of the AIST for their helpful comments on the manuscript. This study was partly supported by the Special Coordination Fund of the Ministry of Education, Culture, Sports, Science and Technology of Japan.

References

Decesari, S., Facchini, M.C., Matta, E., Lettini, F., Miccea, M.,

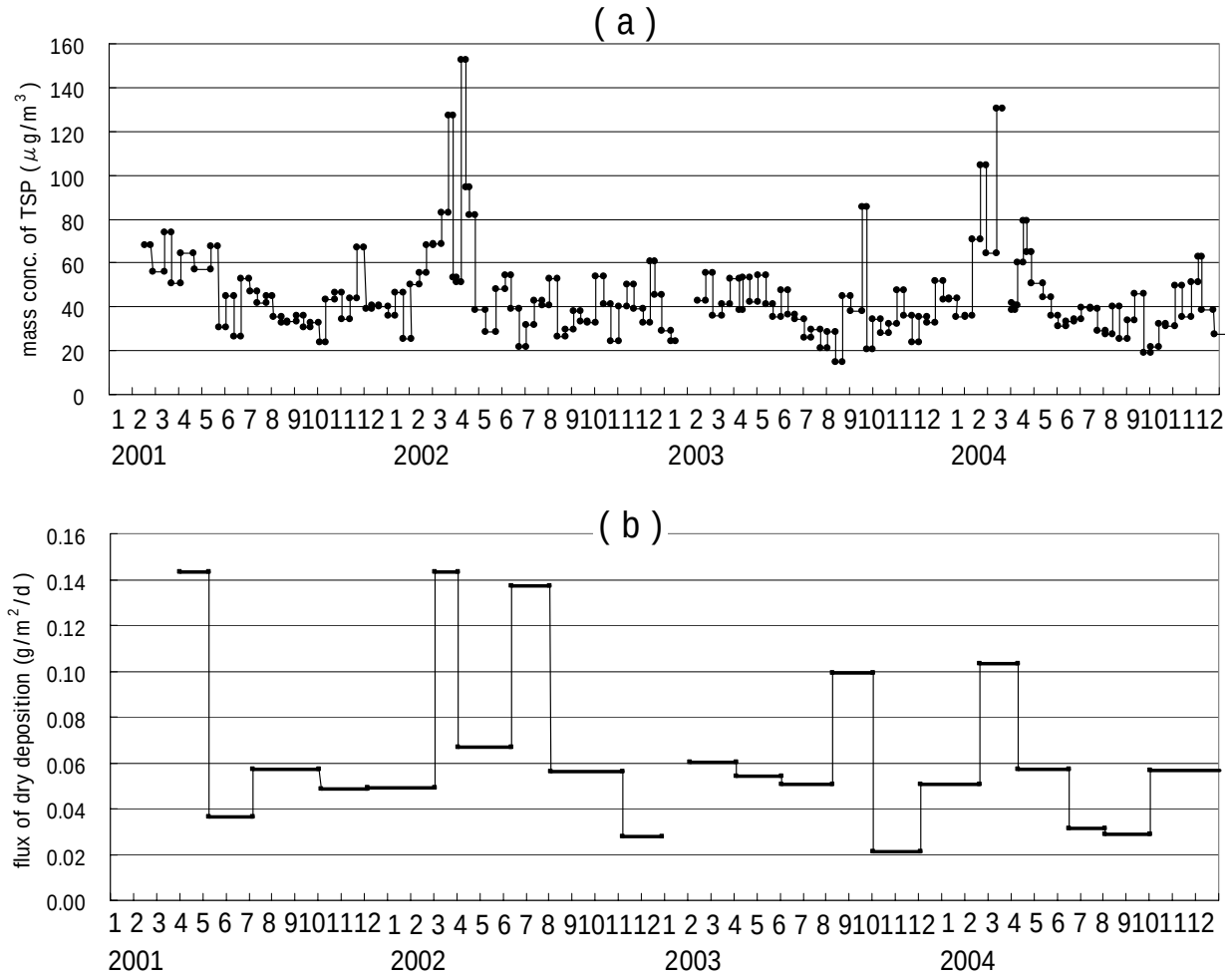


Fig.11 Comparison of (a) mass concentration of TSP and (b) flux of dry deposition in Tsukuba from 2001 to 2004.

- Fuzzi, S., Tagliavini, E. and Putaud, J.-P. (2001) Chemical features and seasonal variation of fine aerosol water-soluble organic compounds in the Po Valley, Italy. *Atmos. Environ.*, **35**, 3691-3699.
- Guo, Z.G., Feng, J.L., Fang, M., Chen, H.Y. and Lau, K.H. (2004) The elemental and organic characteristics of PM_{2.5} in Asian dust episodes in Qingdao, China, 2002. *Atmos. Environ.*, **38**, 909-919.
- Han, Z., Ueda, H., Matsuda, K., Zhang, R., Arao, K., Kanai, Y. and Hasome, H. (2004) Model study on particle size segregation and deposition during Asian dust events in March 2002, *J. Geophys. Res.*, **109**, No. D19, D19205.
- Japan Meteorological Agency (2005) <http://www.data.kishou.go.jp/obs-env/hp/4-4kosa.html>
- Kamioka, H. and Kanai, Y. (2002) Water-soluble ion species in Aeolian dust collected by a low-volume air sampler in Tsukuba, Ibaraki. 49th annual meeting of the Geochemical Society of Japan, Kagoshima (2002.9), 136. (abstract in Japanese)
- Kanai, Y. (2001) Outline of the project "Studies on origin and transport of aeolian dust and its impact on climate", and quaternary and geochemical studies on aerosol. *Chishitsu News*, **565**, 11-23. (in Japanese)
- Kanai, Y., Ohta, A., Kamioka, H., Terashima, S., Matsuhisa, Y., Shimizu, H., Takahashi, Y., Kai, K., Xu, B., Hayashi, M. and Zhang, R. (2002a) Preliminary study on the grain-size distribution and concentration of aeolian dust collected in Japan. *J. Arid Land Studies*, **11**, 307-314.
- Kanai, Y., Ohta, A., Kamioka, H., Terashima, S., Imai, N., Matsuhisa, Y., Shimizu, H., Takahashi, Y., Kai, K., Xu, B., Hayashi, M. and Zhang, R. (2002b) Observation of transported aeolian dust in east China and Japan. 49th Annual Meeting of the Geochemical Society of Japan, Kagoshima (2002.9), 139. (abstract in Japanese)
- Kanai, Y., Ohta, A., Kamioka, H., Terashima, S., Imai, N., Matsuhisa, Y., Kanai, M., Shimizu, H., Takahashi, Y., Kai, K., Xu, B., Hayashi, M. and Zhang, R. (2003) Variation of concentrations and physicochemical properties of aeolian dust obtained in east China and Japan from 2001 to 2002. *Bulletin of Geological Survey of Japan*, **54**, 251-267.

- Kanai, Y., Ohta, A., Kamioka, H., Terashima, S., Imai, N., Kanai, M., Shimizu, H., Takahashi, Y., Kai, K., Hayashi, M., Zhang, R. and Sheng, L. (2005) Characterization of Aeolian dust in east China and Japan from 2001 to 2003. *Journal of the Meteorological Society of Japan*, **83A**, 73-106.
- Lee, B-K., Jun, N-Y. and Lee, H.K. (2004) Comparison of particulate matter characteristics before, during, and after Asian dust events in Incheon and Ulsan, Korea. *Atmos. Environ.*, **38**, 1535-1545.
- Ma, C-J., Tohno, S., Kasahara, M. and Hayakawa, S. (2004a) The nature of individual Asian dust storm particles collected at Kosan, Korea during ACE-Asia. *Atmos. Environ.*, **38**, 1133-1143.
- Ma, C-J., Tohno, S., Kasahara, M. and Hayakawa, S. (2004b) Properties of individual solid particles retained in size-resolved raindrops fallen in Asian dust storm event during ACER-Asia. *Atmos. Environ.*, **38**, 2951-2964.
- Mikami, M., Abe, O., Du, M., Chiba, O., Fujita, K., Hayashi, M., Iwasaka, Y., Kai, K., Masuda, K., Nagai, T., Ootomo, T., Suzuki, J., Uchiyama, A., Yabuki, S., Yamada, Y., Yasui, M., Shi, G., Zhang, X., Shen, Z., Wei, W. and Zhou, J. (2002) The impact of Aeolian dust on climate: Shino-Japan cooperative project ADEC. *J. Arid Land Studies*, **11**, 211-222.
- Mori, I., Nishikawa, M., Tanimura, T. and Quan, H. (2003) Change in size distribution and chemical composition of kosa (Asian dust) aerosol during long-range transport. *Atmos. Environ.*, **37**, 4253-4263.
- Ohta, A., Terashima, S., Kanai, Y., Kamioka, H., Imai, N., Matsuhisa, Y., Shimizu, H., Takahashi, Y., Kai, K., Hayashi, M. and Zhang, R. (2003) Grain-size distribution and chemical composition of water-insoluble components in aeolian dust collected in Japan in spring 2002. *Bulletin of Geological Survey of Japan*, **54**, 303-322.
- Ohta, A., Tsuno, H., Kagi, H., Kanai, Y. and Nomura, M. (2004) XAFS analysis of Fe, Mn, and Zn of an aeolian dust during transportation from China to Japan. *KEK Report*, **21B**, 20.
- Ohta, A., Kanai, Y., Terashima, S., Kamioka, H., Imai, N., Matsuhisa, Y., Shimizu, H., Takahashi, Y., Kai, K., Hayashi, M., Zhang, R., Tsuno, H., Kagi, H. and Nomura, M. (2005a) Elucidation of elemental behavior of aeolian dust transported from China to Japan. The 4th ADEC (Aeolian Dust Experiment on Climate Impact) Workshop, 297-300.
- Ohta, A., Terashima, S., Kanai, Y., Kamioka, H., Imai, N., Matsuhisa, Y., Shimizu, H., Takahashi, Y., Kai, K., Hayashi, M. and Zhang, R. (2005b) Seasonal change of chemical composition of water-insoluble components in aeolian dust collected in Tsukuba from February 2001 to June 2002. *Bull. Geol. Surv. Japan*, **56**, 99-116. (in Japanese with English abstract)
- Ohta, A., Terashima, S., Kanai, Y., Kamioka, H., Imai, N., Matsuhisa, Y., Shimizu, H., Takahashi, Y., Kai, K., Hayashi, M. and Zhang, R. (2005c) Grain-size distribution and chemical composition of water-insoluble components in aeolian dust collected in China in spring 2002. *Bull. Geol. Surv. Japan*, **56**, 259-272.
- Shao, Y., Yang, Y., Wang, J., Song, Z., Leslie, L., Dong, C., Zhang, Z., Lin, Z., Kanai, Y., Yabuki, S. and Chun, Y. (2003) Northeast Asian dust storms: Real-time numerical prediction and validation. *J. Geophys. Res.*, Vol. **108**, No. D22, 4691.
- Streets, D.G., Gupta, S., Waldhoff, S.T., Wang, M.Q., Bond, T.C. and Yiyun, B. (2001) Black carbon emissions in China. *Atmospheric Environment*, **35**, 4281-4296.
- Topping, D., Coe, H., McFiggans, G., Burgess, R., Allan, J., Alfarra, M.R., Bower, K., Choularton, T.W., Decesari, S. and Facchini, M.C. (2004) Aerosol chemical characteristics from sampling conducted on the Island of Jeju, Korea during ACE Asia. *Atmos. Environ.*, **38**, 2111-2123.
- Wilson, W.E. and Suh, H.H. (1997) Fine particles and coarse particles: Concentration relationships relevant to epidemiologic studies. *J. Air & Waste Manage. Assoc.*, **47**, 1238-1249.
- Yabuki, S., Kanayama, S., Fu, F., Honda, M., Yanagisawa, F., Wei, W., Zheng, F., Liu, M., Shen, Z. and Liu, L. (2002) Physical and chemical characteristics of aeolian dust collected over Asian dust source regions in China – comparison with atmospheric aerosols in an urban area at Wako, Japan. *J. Arid Land Studies*, **11**, 273-289.
- Zhang, M., Uno, I., Yoshida, Y., Xu, Y., Wang, Z., Akimoto, H., Bates, T., Quinn, T., Bandy, A. and Blomquist, B. (2004) Transport and transformation of sulfur compounds over East Asia during the TRACE-P and ACE-Asia campaigns. *Atmos. Environ.*, **38**, 6947-6959.
- Zhang, R., Shi, G., Kanai, Y., Ohta, A., Xu, Y., Gong, Y. and Chen, H. (2002) TSP mass concentration and number concentration of particles in dust storm weather in 2002 spring of Beijing. *The Chinese Journal of Process Engineering*, **2**, 289-292. (in Chinese with English abstract)
- Zhang, R., Wang, M., Zhang, X. and Zhu, G. (2003a) Analysis on the chemical and physical properties of particles in a dust storm in spring in Beijing. *Powder Technology*, **137**, 77-82.
- Zhang, R., Yongfu, X. and Zhiwei, H. (2003b) Inorganic chemical composition and source signature of PM_{2.5} in Beijing during ACE-Asia period. *Chinese Science Bulletin*, **48**, 1002-1005.
- Zhang, R., Wang, M., Sheng, L., Kanai, Y. and Ohta, A. (2004) Seasonal characterization of dust days, mass concentration and dry deposition of atmospheric aerosols over Qingdao, China. *China Particology*, **2**, 296-199.

Received April 19, 2005

Accepted July 21, 2005

アジア東部における大気中エアロゾル濃度、粒径分布及びつくばにおける
乾質降下物の観測と OPC 観測

金井 豊・太田充恒・上岡 晃・今井 登・清水 洋・高橋嘉夫・甲斐憲次・林 政彦・張 仁健

要 旨

日中共同研究「風送ダストの大気中への供給量評価と気候への影響に関する研究 (ADEC)」のなかで、中国の北京、青島、合肥、及び国内の福岡、名古屋、つくば、那覇で2001年春から風送ダストの観測を開始した。本報告では、ハイボリュームエアサンプラーによる全浮遊粒子 (TSP) 濃度とアンダーセン型のローボリュームエアサンプラーによって得られる粒径分布を報告する。更に、つくばにおける2004年3月のOPCによる観測結果や乾質降下物の変動も報告した。

長期にわたるTSP観測によって季節変動や地域差が明らかになった。ダスト濃度は概して春に高濃度となり、集中観測期間(IOPs)が毎年春季に設定された。IOP-2 (2003年3月) やIOP-3 (2004年3月) では大きなダストイベントがほとんど観測されなかったが、2002年4月のIOP-1では大きなダストイベントが観測された。ダストの粒径分布は、自然起源と人工物起源とを示す二山形を示した。ダストイベントが起こった時には、粗粒フラクションが増加した。粒径分布と粒子数の短期変動を明らかにするために、OPCによる観測が2004年の3月に行われた。粒子特性は時間ごとに変動しており、OPCは時間分解能がよいのでエアロゾルの短期変動の観測に非常に有用であることが示された。つくばにおける乾質降下物の変動パターンはTSPのパターンとほぼ類似していた。

Appendix 1 Mass concentrations of TSP in (1) Tsukuba, (2) Nagoya, (3) Fukuoka, (4) Naha, (5) Beijing, (6) Qingdao and (7) Hefei by a high-volume air sampler. The times in the appendix tables are shown as the local time in Japan (JST) and China (CST).

(1) Tsukuba											
No.	start		end		$\mu\text{ g/m}^3$	No.	start		end		$\mu\text{ g/m}^3$
1	16-Feb-01	15:55	~ 23-Feb-01	14:17	68.25	69	08-Jan-03	10:54	~ 15-Jan-03	11:45	24.49
2	26-Feb-01	17:05	~ 12-Mar-01	10:25	56.20	70	13-Feb-03	10:18	~ 24-Feb-03	10:18	42.55
3	12-Mar-01	11:35	~ 21-Mar-01	17:17	73.67	71	24-Feb-03	10:21	~ 03-Mar-03	10:49	55.26
4	21-Mar-01	17:21	~ 02-Apr-01	14:12	50.84	72	03-Mar-03	11:13	~ 14-Mar-03	10:09	36.01
5	02-Apr-01	14:43	~ 19-Apr-01	17:43	64.18	73	14-Mar-03	10:13	~ 25-Mar-03	10:17	41.41
6	20-Apr-01	17:55	~ 11-May-01	18:19	56.96	74	25-Mar-03	10:19	~ 07-Apr-03	9:38	52.63
7	11-May-01	18:23	~ 21-May-01	15:47	67.66	75	07-Apr-03	9:40	~ 12-Apr-03	13:39	38.58
8	22-May-01	18:04	~ 01-Jun-01	16:12	30.82	76	12-Apr-03	13:43	~ 21-Apr-03	10:07	53.08
9	01-Jun-01	16:15	~ 11-Jun-01	15:39	44.66	77	21-Apr-03	10:09	~ 01-May-03	9:44	42.06
10	11-Jun-01	15:42	~ 21-Jun-01	14:55	26.37	78	01-May-03	9:48	~ 12-May-03	9:55	54.26
11	21-Jun-01	15:03	~ 02-Jul-01	11:35	52.71	79	12-May-03	9:57	~ 21-May-03	14:08	41.08
12	02-Jul-01	18:42	~ 11-Jul-01	16:39	46.84	80	21-May-03	14:10	~ 02-Jun-03	9:39	35.40
13	11-Jul-01	16:41	~ 23-Jul-01	18:50	41.54	81	02-Jun-03	9:41	~ 11-Jun-03	9:40	47.70
14	23-Jul-01	18:53	~ 02-Aug-01	9:03	44.83	82	11-Jun-03	9:55	~ 20-Jun-03	14:00	36.55
15	02-Aug-01	16:42	~ 13-Aug-01	10:53	35.36	83	20-Jun-03	14:11	~ 01-Jul-03	9:57	34.17
16	13-Aug-01	10:57	~ 21-Aug-01	9:58	32.52	84	01-Jul-03	9:56	~ 11-Jul-03	9:04	26.03
17	21-Aug-01	17:17	~ 03-Sep-01	9:10	33.39	85	11-Jul-03	9:19	~ 22-Jul-03	11:22	29.39
18	03-Sep-01	9:14	~ 12-Sep-01	10:25	36.11	86	22-Jul-03	11:22	~ 31-Jul-03	9:32	20.94
19	12-Sep-01	10:27	~ 21-Sep-01	10:20	30.45	87	31-Jul-03	9:35	~ 12-Aug-03	10:47	28.37
20	21-Sep-01	10:25	~ 01-Oct-01	10:45	32.95	88	12-Aug-03	10:49	~ 21-Aug-03	13:37	14.54
21	03-Oct-01	15:14	~ 11-Oct-01	11:00	23.51	89	21-Aug-03	13:40	~ 01-Sep-03	13:20	44.95
22	11-Oct-01	11:04	~ 22-Oct-01	13:20	43.17	90	01-Sep-03	13:22	~ 16-Sep-03	10:06	38.20
23	22-Oct-01	13:24	~ 02-Nov-01	10:07	46.30	91	16-Sep-03	10:24	~ 22-Sep-03	13:20	85.70
24	02-Nov-01	10:11	~ 12-Nov-01	10:00	34.33	92	22-Sep-03	13:22	~ 30-Sep-03	10:17	20.84
25	12-Nov-01	10:05	~ 21-Nov-01	13:29	43.83	93	30-Sep-03	10:20	~ 10-Oct-03	17:30	34.07
26	21-Nov-01	13:35	~ 30-Nov-01	10:05	67.10	94	10-Oct-03	17:32	~ 21-Oct-03	9:59	28.17
27	03-Dec-01	15:07	~ 11-Dec-01	14:11	39.29	95	21-Oct-03	10:02	~ 31-Oct-03	11:12	32.16
28	11-Dec-01	14:14	~ 20-Dec-01	13:41	40.83	96	31-Oct-03	11:14	~ 11-Nov-03	9:13	47.66
29	20-Dec-01	13:45	~ 31-Dec-01	14:00	40.13	97	11-Nov-03	9:15	~ 21-Nov-03	11:08	35.99
30	31-Dec-01	14:04	~ 11-Jan-02	10:48	35.97	98	21-Nov-03	11:10	~ 01-Dec-03	10:10	23.84
31	11-Jan-02	10:55	~ 21-Jan-02	9:03	46.61	99	01-Dec-03	10:15	~ 11-Dec-03	13:22	35.32
32	21-Jan-02	14:16	~ 01-Feb-02	13:35	25.56	100	11-Dec-03	13:29	~ 22-Dec-03	10:01	32.61
33	01-Feb-02	13:28	~ 12-Feb-02	10:08	50.38	101	22-Dec-03	10:05	~ 31-Dec-03	14:58	51.54
34	12-Feb-02	10:10	~ 21-Feb-02	14:35	55.52	102	31-Dec-03	15:00	~ 09-Jan-04	15:40	43.56
35	21-Feb-02	14:38	~ 01-Mar-02	10:54	68.38	103	09-Jan-04	15:43	~ 19-Jan-04	19:40	43.85
36	01-Mar-02	10:57	~ 11-Mar-02	10:18	68.58	104	19-Jan-04	10:45	~ 30-Jan-04	9:57	35.48
37	11-Mar-02	10:28	~ 20-Mar-02	10:15	82.89	105	30-Jan-04	9:50	~ 10-Feb-04	10:27	35.96
38	20-Mar-02	10:20	~ 26-Mar-02	10:17	127.37	106	10-Feb-04	11:03	~ 20-Feb-04	10:03	70.77
39	26-Mar-02	10:21	~ 01-Apr-02	13:09	53.21	107	20-Feb-04	10:35	~ 27-Feb-04	9:48	104.55
40	01-Apr-02	13:10	~ 06-Apr-02	13:35	51.02	108	27-Feb-04	10:06	~ 11-Mar-04	11:38	64.40
41	06-Apr-02	13:37	~ 12-Apr-02	13:36	152.36	109	11-Mar-04	11:40	~ 18-Mar-04	10:37	130.54
42	12-Apr-02	13:38	~ 17-Apr-02	10:16	94.29	110	18-Mar-04	10:40	~ 29-Mar-04	9:11	-
43	17-Apr-02	10:19	~ 24-Apr-02	9:22	81.93	111	29-Mar-04	9:13	~ 31-Mar-04	10:07	41.94
44	24-Apr-02	9:26	~ 08-May-02	9:34	38.69	112	31-Mar-04	10:09	~ 05-Apr-04	10:03	38.70
45	08-May-02	9:38	~ 21-May-02	10:48	28.65	113	05-Apr-04	10:05	~ 08-Apr-04	13:36	40.61
46	21-May-02	11:49	~ 03-Jun-02	10:17	48.17	114	08-Apr-04	14:10	~ 16-Apr-04	9:26	60.28
47	03-Jun-02	10:22	~ 11-Jun-02	9:55	54.19	115	16-Apr-04	9:29	~ 20-Apr-04	9:59	79.36
48	11-Jun-02	10:10	~ 21-Jun-02	9:28	39.05	116	20-Apr-04	9:53	~ 26-Apr-04	9:36	64.79
49	21-Jun-02	9:31	~ 01-Jul-02	9:34	21.59	117	26-Apr-04	9:36	~ 11-May-04	10:01	50.81
50	01-Jul-02	9:37	~ 11-Jul-02	10:01	31.70	118	11-May-04	10:03	~ 21-May-04	9:52	44.62
51	11-Jul-02	10:04	~ 22-Jul-02	10:18	42.76	119	21-May-04	9:54	~ 01-Jun-04	10:10	35.66
52	22-Jul-02	10:20	~ 01-Aug-02	15:04	40.40	120	01-Jun-04	11:13	~ 11-Jun-04	9:48	31.11
53	01-Aug-02	15:07	~ 12-Aug-02	10:34	52.96	121	11-Jun-04	9:42	~ 21-Jun-04	9:33	33.38
54	12-Aug-02	10:37	~ 22-Aug-02	9:34	26.23	122	21-Jun-04	9:36	~ 01-Jul-04	10:13	34.33
55	22-Aug-02	9:37	~ 02-Sep-02	9:49	29.34	123	01-Jul-04	10:16	~ 12-Jul-04	11:22	39.65
56	02-Sep-02	9:51	~ 11-Sep-02	12:22	38.06	124	12-Jul-04	13:21	~ 21-Jul-04	10:17	39.08
57	11-Sep-02	12:25	~ 20-Sep-02	9:45	33.13	125	21-Jul-04	10:20	~ 02-Aug-04	10:13	28.97
58	20-Sep-02	9:55	~ 01-Oct-02	10:08	32.86	126	02-Aug-04	10:15	~ 11-Aug-04	10:06	27.46
59	01-Oct-02	10:11	~ 11-Oct-02	10:07	53.99	127	11-Aug-04	10:08	~ 20-Aug-04	10:00	40.07
60	11-Oct-02	10:11	~ 21-Oct-02	10:01	40.99	128	20-Aug-04	10:02	~ 01-Sep-04	10:05	25.38
61	21-Oct-02	10:03	~ 01-Nov-02	9:38	24.55	129	01-Sep-04	10:07	~ 10-Sep-04	10:40	33.63
62	01-Nov-02	9:51	~ 11-Nov-02	10:00	40.10	130	10-Sep-04	10:42	~ 22-Sep-04	9:41	45.69
63	11-Nov-02	10:03	~ 20-Nov-02	10:00	50.18	131	22-Sep-04	9:45	~ 01-Oct-04	14:53	18.75
64	20-Nov-02	10:02	~ 02-Dec-02	10:48	39.22	132	01-Oct-04	14:55	~ 12-Oct-04	10:10	21.42
65	02-Dec-02	11:05	~ 11-Dec-02	10:14	32.60	133	12-Oct-04	9:37	~ 21-Oct-04	9:55	32.06
66	11-Dec-02	10:18	~ 18-Dec-02	13:38	60.73	134	21-Oct-04	11:24	~ 02-Nov-04	15:05	31.25
67	18-Dec-02	13:41	~ 27-Dec-02	10:20	45.44	135	02-Nov-04	15:08	~ 11-Nov-04	10:40	49.38
68	27-Dec-02	10:23	~ 08-Jan-03	10:51	29.25	136	11-Nov-04	10:48	~ 23-Nov-04	14:29	35.47
						137	23-Nov-04	16:31	~ 02-Dec-04	9:55	51.26

Appendix 1 (continue).

No.	start		end		μ g/m ³
138	02-Dec-04	9:58	~ 07-Dec-04	10:45	62.96
139	07-Dec-04	11:35	~ 22-Dec-04	10:20	38.48
140	24-Dec-04	14:53	~ 12-Jan-05	14:16	27.72
141	23-Feb-05	11:45	~ 08-Mar-05	9:29	30.57
142	08-Mar-05	9:31	~ 22-Mar-05	9:12	78.75
143	22-Mar-05	9:14	~ 01-Apr-05	13:02	43.41
144	01-Apr-05	13:05	~ 12-Apr-05	11:28	86.96
145	12-Apr-05	11:30	~ 19-Apr-05	11:40	77.50
146	19-Apr-05	11:43	~ 02-May-05	16:22	49.40
147	02-May-05	16:24	~ 11-May-05	16:54	62.94
148	11-May-05	17:08	~ 25-May-05	13:15	38.99

(2) Nagoya

No.	start		end		μ g/m ³
1	-				
2	15-Mar-01	14:26	~ 20-Mar-01	17:00	83.97
3	-				
4	26-Mar-01	12:30	~ 01-Apr-01	15:35	49.74
5	01-Apr-01	15:40	~ 07-Apr-01	13:56	55.82
6	07-Apr-01	14:00	~ 12-Apr-01	15:51	85.40
7	12-Apr-01	15:52	~ 17-Apr-01	18:32	106.34
8	17-Apr-01	18:37	~ 24-Apr-01	12:10	85.19
9	26-Apr-01	9:35	~ 04-May-01	13:40	41.75
10	04-May-01	13:40	~ 11-May-01	15:20	37.66
11	11-May-01	15:23	~ 19-May-01	12:45	84.82
12	23-May-01	13:15	~ 31-May-01	12:10	39.39
13	01-Jun-01	10:55	~ 07-Jun-01	16:00	48.19
14	07-Jun-01	16:05	~ 14-Jun-01	16:30	54.21
15	16-Jun-01	11:55	~ 25-Jun-01	15:05	41.26
16	26-Jun-01	18:15	~ 03-Jul-01	11:45	47.72
17	05-Jul-01	10:05	~ 11-Jul-01	11:30	39.64
18	11-Jul-01	12:40	~ 19-Jul-01	10:05	27.82
19	18-Aug-02	14:50	~ 22-Aug-02	15:00	31.98
20	23-Aug-02	12:30	~ 29-Aug-02	15:50	33.65
21	29-Aug-02	15:55	~ 04-Sep-02	18:03	37.20
22	04-Sep-02	18:17	~ 11-Sep-02	15:55	32.30
23	11-Sep-02	16:27	~ 17-Sep-02	12:53	20.48
24	19-Sep-02	12:56	~ 26-Sep-02	12:38	36.61
25	29-Sep-02	15:35	~ 08-Oct-02	13:16	37.18
26	08-Oct-02	13:45	~ 17-Oct-02	15:55	40.35
27	17-Oct-02	15:57	~ 25-Oct-02	13:52	33.63
28	25-Oct-02	13:54	~ 31-Oct-02	15:47	44.16
29	31-Oct-02	15:50	~ 07-Nov-02	14:34	39.16
30	07-Nov-02	14:35	~ 14-Nov-02	14:39	35.87
31	14-Nov-02	14:42	~ 21-Nov-02	13:20	36.36
32	21-Nov-02	13:22	~ 28-Nov-02	14:15	44.57
33	28-Nov-02	14:15	~ 05-Dec-02	14:04	41.50
34	05-Dec-02	13:20	~ 12-Dec-02	13:40	24.03
35	12-Dec-02	13:40	~ 19-Dec-02	15:15	28.21
36	19-Dec-02	15:20	~ 26-Dec-02	12:45	27.66
37	26-Dec-02	12:45	~ 08-Jan-02	16:10	25.64
38	08-Jan-02	16:10	~ 16-Jan-02	15:40	54.21
39	16-Jan-02	15:45	~ 22-Jan-02	12:30	45.21
40	01-Feb-02	15:45	~ 08-Feb-02	16:10	28.16
41	08-Feb-02	19:31	~ 15-Feb-02	13:25	24.07
42	15-Feb-02	19:27	~ 25-Feb-02	12:05	35.67
43	25-Feb-02	12:05	~ 04-Mar-02	12:50	48.41
44	04-Mar-02	12:56	~ 11-Mar-02	15:28	42.83
45	11-Mar-02	17:20	~ 18-Mar-02	12:41	45.48
46	18-Mar-02	12:43	~ 27-Mar-02	15:00	94.39
47	28-Mar-02	15:40	~ 02-Apr-02	12:17	49.56
48	02-Apr-02	17:59	~ 08-Apr-02	8:56	69.70
49	08-Apr-02	10:37	~ 10-Apr-02	15:52	196.73
50	10-Apr-02	16:35	~ 12-Apr-02	12:36	131.84
51	12-Apr-02	12:36	~ 16-Apr-02	15:59	94.46
52	16-Apr-02	15:59	~ 22-Apr-02	10:59	73.94
53	22-Apr-02	17:26	~ 25-Apr-02	11:13	74.76
54	25-Apr-02	11:13	~ 02-May-02	14:26	—
55	02-May-02	14:26	~ 09-May-02	12:21	40.22

No.	start		end		μ g/m ³
56	09-May-02	12:25	~ 16-May-02	12:42	41.65
57	16-May-02	12:44	~ 23-May-02	14:48	35.55
58	23-May-02	14:51	~ 31-May-02	12:21	59.75
59	31-May-02	12:08	~ 07-Jun-02	12:29	56.26
60	07-Jun-02	12:33	~ 14-Jun-02	9:18	53.12
61	14-Jun-02	9:21	~ 21-Jun-02	10:21	39.85
62	21-Jun-02	14:40	~ 28-Jun-02	14:00	27.76
63	28-Jun-02	14:00	~ 05-Jul-02	13:54	38.96
64	05-Jul-02	13:56	~ 12-Jul-02	11:45	23.44
65	12-Jul-02	11:50	~ 19-Jul-02	12:58	34.30
66	19-Jul-02	13:00	~ 26-Jul-02	13:36	40.62
67	26-Jul-02	13:39	~ 06-Aug-02	11:55	42.28
68	06-Aug-02	11:56	~ 20-Aug-02	13:31	27.74
69	20-Aug-02	13:33	~ 27-Aug-02	14:53	39.07
70	27-Aug-02	14:55	~ 03-Sep-02	13:56	27.63
71	03-Sep-02	13:57	~ 10-Sep-02	15:25	0.30
72	10-Sep-02	15:26	~ 17-Sep-02	14:17	35.01
73	17-Sep-02	14:21	~ 24-Sep-02	13:05	40.60
74	24-Sep-02	13:07	~ 02-Oct-02	14:14	37.90
75	02-Oct-02	14:16	~ 08-Oct-02	17:27	71.10
76	08-Oct-02	17:29	~ 17-Oct-02	12:46	39.03
77	17-Oct-02	12:45	~ 25-Oct-02	11:53	33.03
78	25-Oct-02	12:00	~ 31-Oct-02	14:20	28.62
79	31-Oct-02	14:24	~ 07-Nov-02	14:41	25.93
80	07-Nov-02	14:45	~ 13-Nov-02	19:39	—
81	13-Nov-02	19:43	~ 21-Nov-02	14:22	45.85
82	21-Nov-02	14:27	~ 29-Nov-02	14:14	37.06
83	29-Nov-02	14:18	~ 06-Dec-02	10:29	49.80
84	06-Dec-02	10:32	~ 13-Dec-02	12:01	27.89
85	13-Dec-02	12:04	~ 19-Dec-02	14:36	43.20
86	19-Dec-02	14:38	~ 27-Dec-02	14:17	36.63
87	27-Dec-02	14:19	~ 04-Jan-03	13:52	20.32
88	04-Jan-03	13:54	~ 10-Jan-03	14:04	24.39
89	10-Jan-03	14:06	~ 16-Jan-03	16:21	40.32
90	16-Jan-03	16:24	~ 23-Jan-03	13:53	38.35
91	23-Jan-03	13:56	~ 29-Jan-03	11:21	22.64
92	29-Jan-03	11:24	~ 06-Feb-03	13:38	23.47
93	06-Feb-03	13:40	~ 14-Feb-03	14:53	39.10
94	14-Feb-03	14:56	~ 21-Feb-03	14:15	41.52
95	21-Feb-03	14:18	~ 28-Feb-03	10:45	31.48
96	28-Feb-03	10:45	~ 07-Mar-03	16:54	33.17
97	07-Mar-03	16:58	~ 14-Mar-03	17:18	23.29
98	14-Mar-03	17:20	~ 24-Mar-03	15:38	45.71
99	24-Mar-03	15:40	~ 27-Mar-03	21:13	51.41
100	27-Mar-03	21:15	~ 28-Mar-03	14:24	32.84
101	28-Mar-03	14:27	~ 07-Apr-03	13:44	45.52
102	07-Apr-03	13:47	~ 11-Apr-03	14:06	31.54
103	11-Apr-03	14:09	~	—	68.64(?)
104	16-May-03	13:49	~ 23-May-03	14:08	49.52
105	23-May-03	14:11	~ 30-May-03	14:08	46.00
106	30-May-03	14:10	~ 06-Jun-03	15:03	44.13
107	06-Jun-03	15:05	~ 13-Jun-03	15:58	51.75
108	13-Jun-03	16:00	~ 20-Jun-03	16:16	25.48
109	20-Jun-03	16:19	~ 27-Jun-03	13:42	40.78
110	27-Jun-03	13:44	~ 04-Jul-03	14:28	29.46
111	04-Jul-03	14:28	~ 11-Jul-03	14:16	36.05
112	11-Jul-03	14:20	~ 18-Jul-03	14:27	27.44
113	18-Jul-03	14:34	~ 25-Jul-03	12:08	31.89
114	25-Jul-03	12:11	~ 01-Aug-03	14:40	27.10
115	01-Aug-03	14:43	~ 08-Aug-03	14:43	30.20
116	11-Aug-03	12:08	~ 19-Aug-03	11:43	21.08
117	19-Aug-03	11:44	~ 27-Aug-03	11:12	38.77
118	27-Aug-03	11:15	~ 02-Sep-03	11:39	36.26
119	02-Sep-03	11:41	~ 11-Sep-03	14:15	39.70
120	11-Sep-03	14:15	~ 19-Sep-03	15:54	40.23
121	19-Sep-03	15:56	~ 25-Sep-03	14:06	21.71
122	25-Sep-03	14:10	~ 01-Oct-03	13:38	24.51
123	01-Oct-03	13:40	~ 08-Oct-03	14:21	37.59
124	08-Oct-03	14:22	~ 17-Oct-03	13:50	41.21

Appendix 1 (continue).

No.	start		end		$\mu \text{ g/m}^3$
125	17-Oct-03	13:53	~ 22-Oct-03	14:12	39.44
126	22-Oct-03	14:13	~ 06-Nov-03	15:24	47.01
127	11-Nov-03	15:54	~ 17-Nov-03	14:51	35.30
128	17-Nov-03	14:51	~ 26-Nov-03	14:03	38.32
129	28-Nov-03	15:09	~ 05-Dec-03	14:03	31.50
130	05-Dec-03	14:06	~ 12-Dec-03	15:23	31.02
131	12-Dec-03	15:26	~ 17-Dec-03	14:37	24.60
132	17-Dec-03	14:41	~ 26-Dec-03	14:40	43.71
133	26-Dec-03	14:42	~ 30-Dec-03	14:36	27.20
134	30-Dec-03	14:40	~ 08-Jan-04	14:51	32.67
135	08-Jan-04	14:55	~ 15-Jan-04	14:03	29.56
136	15-Jan-04	14:05	~ 22-Jan-04	15:42	26.38
137	22-Jan-04	15:45	~ 29-Jan-04	14:27	25.38
138	29-Jan-04	14:30	~ 05-Feb-04	12:59	28.58

(3) Fukuoka

No.	start		end		$\mu \text{ g/m}^3$
1	24-Apr-01	11:40	~ 07-May-01	16:41	70.78
2	07-May-01	17:14	~ 16-May-01	10:41	50.64
3	16-May-01	11:41	~ 23-May-01	11:56	143.42
4	23-May-01	12:22	~ 30-May-01	18:58	55.64
5	30-May-01	19:19	~ 06-Jun-01	13:29	50.56
6	06-Jun-01	13:42	~ 13-Jun-01	16:46	54.04
7	13-Jun-01	16:59	~ 20-Jun-01	13:42	29.48
8	20-Jun-01	13:55	~ 27-Jun-01	10:37	20.51
9	27-Jun-01	18:58	~ 04-Jul-01	12:26	28.11
10	04-Jul-01	14:24	~ 11-Jul-01	11:10	29.52
11	11-Jul-01	14:18	~ 19-Jul-01	9:14	18.91
12	19-Jul-01	9:30	~ 26-Jul-01	11:00	26.35
13	26-Jul-01	11:20	~ 02-Aug-01	13:32	33.01
14	02-Aug-01	13:55	~ 09-Aug-01	10:00	35.99
15	09-Aug-01	11:25	~ 23-Aug-01	11:31	59.15
16	24-Aug-01	11:53	~ 31-Aug-01	17:23	37.17
17	31-Aug-01	18:09	~ 07-Sep-01	10:40	21.05
18	07-Sep-01	16:20	~ 14-Sep-01	10:03	32.51
19	14-Sep-01	20:14	~ 21-Sep-01	9:21	30.50
20	21-Sep-01	18:24	~ 28-Sep-01	10:19	39.19
21	28-Sep-01	14:11	~ 05-Oct-01	11:32	33.26
22	05-Oct-01	14:33	~ 12-Oct-01	10:28	49.17
23	13-Oct-01	15:35	~ 19-Oct-01	10:25	33.49
24	19-Oct-01	13:56	~ 26-Oct-01	11:51	31.12
25	26-Oct-01	14:37	~ 02-Nov-01	9:15	45.08
26	02-Nov-01	15:00	09-Nov-01	10:04	15.78
27	09-Nov-01	13:55	16-Nov-01	12:03	28.37
28	26-Nov-01	14:25	03-Dec-01	11:00	29.51
29	04-Dec-01	14:45	14-Dec-01	13:25	34.30
30	17-Dec-01	15:57	27-Dec-01	13:05	37.76
31	28-Dec-01	17:27	~ 07-Jan-02	13:45	51.15
32	11-Jan-02	9:25	~ 21-Jan-02	9:45	43.32
33	21-Jan-02	12:50	~ 31-Jan-02	13:34	34.52
34	01-Feb-02	16:00	~ 12-Feb-02	10:42	50.43
35	14-Feb-02	10:38	~ 21-Feb-02	14:17	43.52
36	21-Feb-02	15:40	~ 01-Mar-02	10:09	49.43
37	01-Mar-02	10:58	~ 11-Mar-02	10:24	86.52
38	11-Mar-02	10:44	~ 22-Mar-02	11:20	146.44
39	22-Mar-02	16:16	~ 01-Apr-02	12:55	100.86
40	01-Apr-02	13:50	~ 05-Apr-02	18:59	74.78
41	06-Apr-02	9:15	~ 11-Apr-02	15:36	244.54
42	12-Apr-02	11:34	~ 16-Apr-02	12:39	110.27
43	17-Apr-02	10:37	~ 25-Apr-02	9:03	65.85
44	25-Apr-02	11:05	~ 01-May-02	17:01	41.69
45	01-May-02	17:42	~ 10-May-02	21:14	24.66
46	10-May-02	21:23	~ 21-May-02	14:38	26.38
47	21-May-02	15:00	~ 31-May-02	14:08	57.33
48	31-May-02	18:52	~ 10-Jun-02	12:40	89.03
49	10-Jun-02	12:53	~ 20-Jun-02	12:45	47.30
50	21-Jun-02	17:47	~ 01-Jul-02	18:07	20.03
51	01-Jul-02	18:19	~ 11-Jul-02	16:23	23.39
52	22-Jul-02	16:15	~ 30-Jul-02	10:44	33.73

No.	start		end		$\mu \text{ g/m}^3$
53	30-Jul-02	15:12	~ 12-Aug-02	11:45	20.31
54	12-Aug-02	12:00	~ 21-Aug-02	11:30	25.73
55	21-Aug-02	16:17	~ 03-Sep-02	13:31	25.98
56	11-Sep-02	16:54	~ 24-Sep-02	18:26	31.34
57	24-Sep-02	18:43	~ 10-Oct-02	13:22	43.73
58	10-Oct-02	16:25	~ 21-Oct-02	13:05	38.52
59	21-Oct-02	13:26	~ 31-Oct-02	12:50	33.15
60	31-Oct-02	13:27	~ 11-Nov-02	18:14	32.30
61	11-Nov-02	18:25	~ 21-Nov-02	16:50	78.59
62	21-Nov-02	18:09	~ 02-Dec-02	16:43	35.81
63	02-Dec-02	17:01	~ 10-Dec-02	14:06	30.23
64	10-Dec-02	14:57	~ 20-Dec-02	13:35	32.41
65	20-Dec-02	14:40	~ 30-Dec-02	14:50	27.14
66	30-Dec-02	15:12	~ 11-Jan-03	19:06	32.48
67	11-Jan-03	19:24	~ 22-Jan-03	12:13	37.71
68	22-Jan-03	12:31	~ 04-Feb-03	1:35	27.64
69	04-Feb-03	1:54	~ 10-Feb-03	15:42	28.83
70	10-Feb-03	17:28	~ 22-Feb-03	23:16	48.46
71	24-Feb-03	13:30	~ 03-Mar-03	17:18	43.88
72	04-Mar-03	16:10	~ 10-Mar-03	13:38	18.79
73	10-Mar-03	14:00	~ 15-Mar-03	11:08	36.76
74	15-Mar-03	11:33	~ 25-Mar-03	13:17	33.73
75	25-Mar-03	19:10	~ 07-Apr-03	13:24	62.46
76	07-Apr-03	19:05	~ 12-Apr-03	13:28	32.81
77	12-Apr-03	14:05	~ 21-Apr-03	13:55	61.06
78	21-Apr-03	14:44	~ 02-May-03	11:50	53.63
79	03-May-03	0:09	~ 10-May-03	13:14	37.51
80	10-May-03	13:52	~ 16-May-03	13:54	36.32
81	21-May-03	19:41	~ 30-May-03	13:37	42.56
82	30-May-03	14:20	~ 12-Jun-03	13:42	48.86
83	12-Jun-03	14:00	~ 23-Jun-03	15:55	29.51
84	23-Jun-03	16:17	~ 02-Jul-03	18:51	38.77
85	02-Jul-03	20:30	~ 10-Jul-03	13:16	18.71
86	10-Jul-03	14:30	~ 20-Jul-03	19:22	19.43
87	20-Jul-03	19:39	~ 30-Jul-03	13:24	23.21
88	30-Jul-03	13:57	~ 09-Aug-03	15:21	22.79
89	09-Aug-03	15:54	~ 20-Aug-03	18:00	21.91
90	20-Aug-03	18:26	~ 01-Sep-03	19:42	25.51
91	01-Sep-03	20:48	~ 11-Sep-03	17:45	29.02
92	11-Sep-03	21:52	~ 20-Sep-03	19:25	50.94
93	20-Sep-03	20:21	~ 30-Sep-03	11:24	28.97
94	30-Sep-03	22:31	~ 10-Oct-03	15:21	38.97
95	10-Oct-03	16:37	~ 20-Oct-03	13:24	33.43
96	20-Oct-03	14:14	~ 30-Oct-03	15:26	55.88
97	30-Oct-03	16:17	~ 10-Nov-03	16:31	38.16
98	10-Nov-03	17:09	~ 20-Nov-03	17:17	26.33
99	20-Nov-03	17:47	~ 30-Nov-03	15:19	26.20
100	30-Nov-03	16:25	~ 10-Dec-03	12:20	33.71
101	10-Dec-03	13:05	~ 20-Dec-03	15:30	33.72
102	21-Dec-03	12:05	~ 01-Jan-04	20:35	49.61
103	01-Jan-04	21:05	~ 09-Jan-04	15:05	53.12
104	09-Jan-04	15:32	~ 20-Jan-04	22:23	28.49
105	21-Jan-04	16:21	~ 30-Jan-04	16:11	28.84
106	30-Jan-04	16:48	~ 10-Feb-04	23:19	43.16
107	10-Feb-04	23:45	~ 19-Feb-04	15:09	67.27
108	19-Feb-04	15:42	~ 02-Mar-04	13:59	50.62
109	02-Mar-04	14:33	~ 10-Mar-04	14:30	34.03
110	10-Mar-04	17:24	~ 21-Mar-04	16:11	76.95
111	21-Mar-04	16:30	~ 28-Mar-04	16:16	37.15
112	28-Mar-04	17:05	~ 01-Apr-04	8:18	23.24
113	01-Apr-04	8:54	~ 05-Apr-04	15:18	61.31
114	05-Apr-04	16:29	~ 08-Apr-04	12:02	34.57
115	08-Apr-04	12:23	~ 16-Apr-04	11:40	51.45
116	16-Apr-04	21:22	~ 20-Apr-04	16:59	43.80
117	20-Apr-04	17:18	~ 26-Apr-04	14:58	85.26
118	26-Apr-04	15:08	~ 10-May-04	16:56	46.20
119	10-May-04	17:30	~ 21-May-04	14:50	34.52
120	21-May-04	16:32	~ 31-May-04	18:08	43.71
121	31-May-04	18:35	~ 09-Jun-04	17:45	30.21

Appendix 1 (continue).

No.	start	end	μ g/m ³
122	09-Jun-04 17:53	~ 21-Jun-04 18:02	33.92
123	21-Jun-04 18:15	~ 30-Jun-04 13:51	30.47
124	30-Jun-04 14:16	~ 11-Jul-04 16:05	34.16
125	12-Jul-04 22:41	~ 20-Jul-04 23:15	26.95
126	20-Jul-04 23:56	~ 30-Jul-04 20:13	41.03
127	30-Jul-04 20:57	10-Aug-04 15:45	26.86
128	10-Aug-04 16:02	20-Aug-04 13:13	26.57
129	20-Aug-04 13:42	31-Aug-04 7:52	34.46
130	31-Aug-04 8:15	11-Sep-04 21:21	33.86
131	11-Sep-04 21:30	21-Sep-04 13:59	21.26
132	21-Sep-04 15:18	~ 30-Sep-04 21:34	23.53
133	30-Sep-04 22:49	~ 09-Oct-04 11:57	30.62
134	09-Oct-04 14:32	~ 21-Oct-04 11:24	31.34
135	21-Oct-04 12:18	~ 30-Oct-04 10:27	35.84
136	30-Oct-04 11:14	~ 10-Nov-04 11:56	41.66
137	10-Nov-04 13:00	~ 20-Nov-04 10:17	33.03
138	20-Nov-04 10:25	~ 30-Nov-04 14:41	41.14
139	30-Nov-04 15:03	~ 10-Dec-04 11:05	49.64
140	10-Dec-04 11:20	~ 20-Dec-04 16:10	44.39
141	20-Dec-04 16:30	~ 30-Dec-04 16:57	23.08
142	30-Dec-04 17:05	~ 10-Jan-05 19:24	23.12
143	10-Jan-05 19:31	~ 20-Jan-05 15:14	29.80
144	20-Jan-05 15:30	~ 31-Jan-05 15:00	29.24
145	31-Jan-05 15:09	~ 10-Feb-05 14:21	38.70
146	10-Feb-05 14:32	~ 20-Feb-05 12:15	21.70
147	20-Feb-05 13:23	~ 01-Mar-05 17:27	43.38
148	01-Mar-05 17:37	~ 10-Mar-05 12:55	41.17
149	10-Mar-05 13:07	~ 21-Mar-05 14:55	46.56
150	21-Mar-05 15:10	~ 31-Mar-05 16:35	49.18
151	31-Mar-05 16:49	~ 12-Apr-05 15:32	50.14
152	12-Apr-05 15:52	~ 22-Apr-05 15:40	77.52
153	22-Apr-05 16:00	~ 02-May-05 20:58	64.94
154	02-May-05 21:16	~ 13-May-05 21:52	52.72

(4) Naha

No.	start	end	μ g/m ³
(preliminary)			
23-Feb-01	13:40	~ 09-Mar-01 16:10	87.83
09-Mar-01	17:15	~ 23-Mar-01 18:14	42.12
13-Apr-01	9:20	~ 26-Apr-01 8:30	200.22
		—	
		—	
6	10-Jul-01 18:40	~ 19-Jul-01 17:00	21.76
7	20-Jul-01 8:21	~ 30-Jul-01 17:23	19.36
8	02-Aug-01 8:45	~ 13-Aug-01 9:32	35.91
9	20-Aug-01 15:50	~ 10-Sep-01 14:35	17.58
10	10-Sep-01 17:32	~ 01-Oct-01 17:00	20.19
11	03-Oct-01 8:53	~ 23-Oct-01 9:58	46.76
12	23-Oct-01 13:15	~ 12-Nov-01 16:00	70.44
13	13-Nov-01 9:00	~ 29-Nov-01 8:50	70.22
14	04-Dec-01 9:07	~ 25-Dec-01 9:10	72.01
15	26-Dec-01 9:00	~ 15-Jan-02 8:56	45.45
16	15-Jan-02 17:24	~ 04-Feb-02 16:18	31.71
17	05-Feb-02 8:58	~ 25-Feb-02 16:30	49.86
18	26-Feb-02 11:40	~ 18-Mar-02 10:19	39.95
19	18-Mar-02 17:00	~ 07-Apr-02 7:33	62.65
20	07-Apr-02 9:50	~ 17-Apr-02 7:11	102.81
21	17-Apr-02 8:42	~ 24-Apr-02 17:02	40.19
22	25-Apr-02 8:20	~ 15-May-02 9:05	19.77
23	15-May-02 11:40	~ 04-Jun-02 8:58	32.92
24	04-Jun-02 13:15	~ 24-Jun-02 9:01	18.60
25	24-Jun-02 19:00	~ 15-Jul-02 9:01	13.00
26	15-Jul-02 11:59	~ 05-Aug-02 10:45	25.22
27	05-Aug-02 14:46	~ 23-Aug-02 10:35	22.21
28	23-Aug-02 15:27	~ 12-Sep-02 9:11	22.98
29	12-Sep-02 13:25	~ 02-Oct-02 13:58	31.91
30	02-Oct-02 16:28	~ 22-Oct-02 13:16	32.19
31	22-Oct-02 16:04	~ 11-Nov-02 9:36	42.59
32	11-Nov-02 12:00	~ 29-Nov-02 9:20	39.60

No.	start	end	μ g/m ³
33	29-Nov-02 11:45	~ 19-Dec-02 16:53	27.14
34	19-Dec-02 18:58	~ 08-Jan-03 9:02	24.82
35	08-Jan-03 11:05	~ 28-Jan-03 15:48	34.52
36	28-Jan-03 18:05	~ 17-Feb-03 16:05	24.41
37	17-Feb-03 18:21	~ 07-Mar-03 8:41	36.70
38	07-Mar-03 10:59	~ 14-Mar-03 10:24	39.84
39	14-Mar-03 12:31	~ 25-Mar-03 9:34	35.75
40	25-Mar-03 12:00	~ 03-Apr-03 10:11	38.91
41	03-Apr-03 13:19	~ 21-Apr-03 8:54	19.44
42	21-Apr-03 10:56	~ 16-May-03 8:07	—
43	16-May-03 9:53	~ 05-Jun-03 10:16	35.92
44	05-Jun-03 12:34	~ 25-Jun-03 10:01	21.99
45	25-Jun-03 12:34	~ 15-Jul-03 14:46	22.49
46	15-Jul-03 16:51	~ 04-Aug-03 17:14	20.82
47	04-Aug-03 16:51	~ 22-Aug-03 8:05	28.95
48	29-Aug-03 17:32	~ 18-Sep-03 9:25	21.90
49	18-Sep-03 13:18	~ 14-Oct-03 13:28	22.38
50	24-Oct-03 17:05	~ 13-Nov-03 16:00	31.02
51	13-Nov-03 11:32	~ 03-Dec-03 13:07	38.41
52	03-Dec-03 14:50	~ 22-Dec-03 14:25	40.61
53	—		
54	09-Jan-04 11:11	~ 29-Jan-04 9:04	33.29
55	29-Jan-04 10:55	~ 18-Feb-04 9:34	40.24
56	18-Feb-04 11:52	~ 09-Mar-04 9:10	26.34
57	09-Mar-04 11:10	~ 18-Mar-04 11:00	13.90
58	18-Mar-04 13:50	~ 29-Mar-04 13:15	15.37
59	29-Mar-04 15:05	~ 08-Apr-04 13:13	28.90
60	08-Apr-04 15:15	~ 16-Apr-04 9:19	12.80
61	16-Apr-04 11:15	~ 26-Apr-04 9:07	29.27
62	26-Apr-04 11:05	~ 12-May-04 10:03	28.90
63	12-May-04 11:28	~ 01-Jun-04 9:10	20.85
64	01-Jun-04 11:05	~ 18-Jun-04 15:52	20.85
65	22-Jul-04 10:30	~ 12-Aug-04 9:45	23.05
66	12-Aug-04 11:42	~ 02-Sep-04 9:07	26.34
67	02-Sep-04 11:15	~ 22-Sep-04 10:55	26.34
68	22-Sep-04 13:40	~ 12-Oct-04 9:14	24.51
69	12-Oct-04 10:53	~ 01-Nov-04 9:17	34.76
70	01-Nov-04 11:20	~ 19-Nov-04 9:14	29.63
71	19-Nov-04 10:51	~ 01-Dec-04 9:03	27.80
72	—		
73	01-Dec-04 11:13	~ 20-Dec-04 13:42	34.02
74	20-Dec-04 15:00	~ 07-Jan-05 9:10	33.24
75	07-Jan-05 10:48	~ 27-Jan-05 9:10	28.92
76	27-Jan-05 9:12	~ 17-Feb-05 9:12	28.26
77	17-Feb-05 10:55	~ 09-Mar-05 9:20	4.88
78	09-Mar-05 11:07	~ 28-Mar-05 12:32	—

(5) Beijing

No.	start	end	μ g/m ³
1	27-Feb-02 10:00	~ 01-Mar-02 10:00	319.1
2	01-Mar-02 10:00	~ 04-Mar-02 10:00	325.8
3	19-Mar-02 10:00	~ 20-Mar-02 10:45	367.0
4	20-Mar-02 10:45	~ 20-Mar-02 15:30	11642
5	20-Mar-02 15:40	~ 20-Mar-02 21:00	3682.6
6	20-Mar-02 21:00	~ 21-Mar-02 10:00	3045.7
7	21-Mar-02 10:00	~ 22-Mar-02 10:00	1487.4
8	22-Mar-02 10:00	~ 23-Mar-02 10:00	823.3
9	08-Apr-02 9:00	~ 08-Apr-02 12:00	3309.4
10	08-Apr-02 13:00	~ 08-Apr-02 21:00	3014.3
11	11-Apr-02 18:10	~ 11-Apr-02 20:20	3904.2
12	14-Apr-02 13:30	~ 15-Apr-02 9:00	1196.9
13	15-Apr-02 15:50	~ 16-Apr-02 9:00	1061.9
14	16-Apr-02 9:05	~ 16-Apr-02 15:50	1955.4
15	16-Apr-02 15:50	~ 16-Apr-02 22:20	1539.1
16	16-Apr-02 22:30	~ 17-Apr-02 10:00	350.3
17	17-Apr-02 10:00	~ 18-Apr-02 10:00	500.6
18	18-Apr-02 10:00	~ 19-Apr-02 10:00	528.3
19	21-Apr-02 9:40	~ 22-Apr-02 9:40	574.0
20	10-May-02 10:00	~ 12-May-02 10:00	336.7

Appendix 1 (continue).

No.	start		end		$\mu \text{ g/m}^3$
21	20-May-02	10:00	~ 23-May-02	10:00	360.8
22	03-Jun-02	22:30	~ 07-Jun-02	10:30	477.3
23	21-Jun-02	10:00	~ 23-Jun-02	16:00	210.3
24	06-Jul-02	8:30	~ 08-Jul-02	10:00	337.3
25	25-Jul-02	12:00	~ 28-Jul-02	10:00	215.9
26	28-Jul-02	10:00	~ 31-Jul-02	10:00	209.6
27	05-Aug-02	10:00	~ 08-Aug-02	10:00	167.4
28	20-Aug-02	10:00	~ 22-Aug-02	10:00	360.9
29	06-Sep-02	10:00	~ 08-Sep-02	10:00	374.6
30	20-Sep-02	10:00	~ 22-Sep-02	12:00	185.2
31	08-Oct-02	10:30	~ 10-Oct-02	10:00	560.1
32	21-Oct-02	10:00	~ 23-Oct-02	10:00	219.4
33	06-Nov-02	10:00	~ 08-Nov-02	10:00	226.5
34	21-Nov-02	10:00	~ 23-Nov-02	16:00	351.6
35	04-Dec-02	10:00	~ 06-Dec-02	10:00	442.1
36	24-Dec-02	10:00	~ 26-Dec-02	10:00	117.4
37	06-Jan-03	10:00	~ 08-Jan-03	10:00	238.8
38	20-Jan-03	10:00	~ 22-Jan-03	10:00	257.0
39	09-Feb-03	10:00	~ 11-Feb-03	10:00	135.9
40	25-Feb-03	10:00	~ 27-Feb-03	10:00	238.8
41	07-Mar-03	10:00	~ 09-Mar-03	10:00	226.7
42	17-Mar-03	10:00	~ 19-Mar-03	10:00	275.6
43	19-Mar-03	17:00	~ 21-Mar-03	10:00	196.3
44	21-Mar-03	10:00	~ 23-Mar-03	10:00	387.6
45	23-Mar-03	10:00	~ 25-Mar-03	10:00	380.1
46	25-Mar-03	10:00	~ 27-Mar-03	10:00	361.3
47	27-Mar-03	10:00	~ 29-Mar-03	10:00	322.5
48	10-Apr-03	19:00	~ 12-Apr-03	19:00	443.6
49	14-Apr-03	14:30	~ 15-Apr-03	14:30	779.2
50	21-Apr-03	10:00	~ 23-Apr-03	10:00	259.2
51	06-May-03	10:00	~ 08-May-03	10:00	185.0
52	20-May-03	10:00	~ 22-May-03	10:00	287.1
53	04-Jun-03	10:00	~ 06-Jun-03	19:00	218.1
54	26-Jun-03	10:00	~ 28-Jun-03	14:30	203.1
55	04-Jul-03	10:00	~ 06-Jul-03	10:00	163.0
56	21-Jul-03	10:00	~ 23-Jul-03	10:00	239.8
57	05-Aug-03	10:00	~ 07-Aug-03	10:00	241.0
58	20-Aug-03	10:00	~ 22-Aug-03	10:00	334.9
59	09-Sep-03	19:00	~ 11-Sep-03	10:00	227.5
60	22-Sep-03	14:30	~ 24-Sep-03	10:00	282.8
61	09-Oct-03	10:00	~ 11-Oct-03	10:00	234.9
62	20-Oct-03	10:00	~ 22-Oct-03	10:00	314.7
63	05-Nov-03	10:00	~ 07-Nov-03	19:00	112.9
64	20-Nov-03	10:00	~ 22-Nov-03	14:30	199.1
65	04-Dec-03	10:00	~ 06-Dec-03	10:00	209.5
66	05-Jan-04	10:00	~ 07-Jan-04	10:00	289.6
67	29-Jan-04	10:00	~ 31-Jan-04	10:00	230.7
68	10-Feb-04	10:00	~ 12-Feb-04	10:00	306.7
69	23-Feb-04	10:00	~ 25-Feb-04	10:00	366.9
70	08-Mar-04	10:00	~ 10-Mar-04	10:00	739.8
71	23-Mar-04	10:00	~ 25-Mar-04	10:00	123.9
72	28-Mar-04	10:00	~ 29-Mar-04	10:00	566.8
73	29-Mar-04	14:30	~ 30-Mar-04	14:30	346.0
74	07-Apr-04	10:00	~ 09-Apr-04	10:00	266.2
75	23-Apr-04	10:00	~ 25-Apr-04	10:00	407.3
76	10-May-04	10:00	~ 12-May-04	10:00	181.6
77	19-Jun-04	10:00	~ 21-Jun-04	10:00	299.4

(66-77 : data from AN-200)

(6) Qingdao					
No.	start		end		$\mu \text{ g/m}^3$
1	01-May-01	8:30	~ 06-May-01	9:00	27.17
2	06-May-01	9:00	~ 11-May-01	8:20	97.29
3	12-May-01	8:30	~ 15-May-01	7:55	79.51
4	22-May-01	10:00	~ 24-May-01	12:20	117.46
5	06-Jun-01	9:45	~ 11-Jun-01	10:00	76.94
6	14-Jun-01	10:30	~ 19-Jun-01	10:00	40.89
7	19-Jun-01	10:04	~ 24-Jun-01	8:50	88.33
8	25-Jun-01	8:30	~ 29-Jun-01	10:00	55.79

No.	start		end		$\mu \text{ g/m}^3$
9	02-Jul-01	14:35	~ 06-Jul-01	14:35	162.71
10	07-Jul-01	8:20	~ 11-Jul-01	8:20	69.62
11	13-Jul-01	11:20	~ 17-Jul-01	11:02	105.80
12	25-Jul-01	10:10	~ 29-Jul-01	10:10	102.95
13	02-Aug-01	9:10	~ 06-Aug-01	9:18	37.36
14	07-Aug-01	10:10	~ 11-Aug-01	10:50	147.32
15	17-Aug-01	10:20	~ 21-Aug-01	16:35	51.27
16	24-Aug-01	9:20	~ 29-Aug-01	9:20	119.26
17	04-Sep-01	10:24	~ 08-Sep-01	10:24	100.09
18	13-Sep-01	10:30	~ 17-Sep-01	10:30	65.76
19	20-Sep-01	13:25	~ 25-Sep-01	13:25	96.87
20	03-Oct-01	9:46	~ 07-Oct-01	9:46	71.20
21	25-Oct-01	14:30	~ 29-Oct-01	15:40	200.84
22	12-Nov-01	9:15	~ 16-Nov-01	9:15	103.66
23	21-Nov-01	10:30	~ 26-Nov-01	15:25	147.11
24	07-Dec-01	14:00	~ 12-Dec-01	14:00	245.72
25	24-Dec-01	9:40	~ 27-Dec-01	9:45	220.75
26	05-Jan-02	11:30	~ 08-Jan-02	14:07	229.10
27	13-Jan-02	10:55	~ 14-Jan-02	11:30	166.13
28	21-Jan-02	10:30	~ 24-Jan-02	10:45	152.71
29	03-Feb-02	12:25	~ 06-Feb-02	10:48	172.69
30	16-Feb-02	15:30	~ 20-Feb-02	15:30	153.82
31	25-Feb-02	8:30	~ 28-Feb-02	17:55	289.43
32	02-Mar-02	15:20	~ 05-Mar-02	9:14	172.03
33	15-Mar-02	11:05	~ 19-Mar-02	10:55	488.00
34	21-Mar-02	10:55	~ 23-Mar-02	10:15	721.39
35	01-Apr-02	16:30	~ 04-Apr-02	15:30	93.81
36	09-Apr-02	10:20	~ 13-Apr-02	15:38	336.87
37	15-Apr-02	13:30	~ 19-Apr-02	16:30	268.72
38	07-May-02	14:00	~ 12-May-02	9:35	55.99
39	22-May-02	11:30	~ 26-May-02	11:30	169.76
40	05-Jun-02	10:00	~ 09-Jun-02	8:10	73.96
41	15-Jun-02	14:20	~ 19-Jun-02	9:50	77.15
42	21-Jun-02	10:30	~ 29-Jun-02	9:05	32.25
43	06-Jul-02	11:00	~ 10-Jul-02	10:45	140.75
44	14-Jul-02	12:17	~ 17-Jul-02	15:43	169.29
45	02-Aug-02	10:15	~ 06-Aug-02	10:00	71.82
46	16-Aug-02	10:10	~ 21-Aug-02	11:53	147.94
47	05-Sep-02	11:05	~ 10-Sep-02	16:05	114.12
48	22-Sep-02	9:50	~ 26-Sep-02	16:30	134.96
49	08-Oct-02	10:00	~ 12-Oct-02	15:25	53.73
50	22-Oct-02	9:40	~ 26-Oct-02	10:50	155.54
51	08-Nov-02	9:00	~ 12-Nov-02	16:35	268.83
52	23-Nov-02	10:35	~ 27-Nov-02	8:40	175.72
53	08-Dec-02	15:10	~ 12-Dec-02	15:30	225.45
54	21-Dec-02	9:25	~ 25-Dec-02	14:20	106.06
55	05-Jan-03	10:40	~ 09-Jan-03	8:35	210.41
56	19-Jan-03	10:30	~ 23-Jan-03	10:30	90.56
57	05-Feb-03	16:45	~ 09-Feb-03	15:47	92.18
58	20-Feb-03	10:00	~ 24-Feb-03	15:00	141.50
59	17-Mar-03	8:35	~ 20-Mar-03	17:10	172.37
60	25-Mar-03	16:00	~ 28-Mar-03	17:21	201.98
61	13-Apr-03	9:15	~ 16-Apr-03	17:00	186.33
62	25-Apr-03	11:20	~ 28-Apr-03	12:26	115.85
63	15-May-03	15:00	~ 19-May-03	8:10	120.71
64	26-May-03	14:55	~ 29-May-03	17:06	64.71
65	11-Jul-03	9:15	~ 15-Jul-03	9:00	67.26

(7) Hefei

No.	start		end		$\mu \text{ g/m}^3$
1	15-Mar-02	15:10	~ 20-Mar-02	15:58	269.73
2	21-Mar-02	10:30	~ 27-Mar-02	16:41	211.03
3	30-Mar-02	19:00	~ 05-Apr-02	16:04	364.85
4	12-Apr-02	8:40	~ 19-Apr-02	14:35	170.08

Appendix 2 Size-segregated aeolian dust concentrations observed by a low-volume air sampler in (1) Tsukuba, (2) Nagoya, (3) Fukuoka, (4) Naha, (5) Beijing, (6) Qingdao and (7) Hefei.

(1) Tsukuba

No.	start		end		aeolian dust concentration ($\mu\text{g}/\text{m}^3$)								backup filter
	date	time	date	time	stage 0	stage 1	stage 2	stage 3	stage 4	stage 5	stage 6	stage 7	
1	16-Feb-01	15:55	~ 23-Feb-01	14:35	3.14	2.76	4.17	4.81	2.72	3.85	8.87	11.3	8.06
2	26-Feb-01	17:05	~ 26-Apr-01	11:00	5.38	3.30	5.68	6.32	4.17	2.58	3.96	3.95	4.52
3	27-Apr-01	11:43	~ 21-May-01	15:45	0.00	3.33	5.59	7.47	5.22	2.99	4.55	5.15	4.53
4	22-May-01	18:04	~ 11-Jun-01	15:43	1.75	1.66	2.77	3.24	2.76	3.03	5.08	4.98	2.66
5	12-Jun-01	12:45	~ 02-Jul-01	11:06	2.13	1.76	2.01	2.47	2.71	3.46	6.85	5.55	3.04
6	02-Jul-01	18:43	~ 02-Aug-01	9:06	3.44	2.81	3.15	3.96	3.66	2.80	3.52	3.99	2.77
7	02-Aug-01	16:42	~ 21-Aug-01	9:59	1.68	1.30	5.72	2.31	1.97	1.66	3.34	3.93	3.17
8	23-Aug-01	9:03	~ 12-Sep-01	10:23	0.00	0.35	1.76	3.39	3.28	3.28	3.37	3.73	2.08
9	12-Sep-01	17:38	~ 01-Oct-01	10:48	1.61	1.21	2.98	1.95	0.21	1.93	3.37	2.96	3.34
10	03-Oct-01	15:15	~ 22-Oct-01	13:27	1.94	0.64	1.61	2.57	1.84	1.61	3.12	3.73	6.28
11	22-Oct-01	17:15	~ 12-Nov-01	10:06	0.00	0.00	1.87	1.49	0.00	1.67	1.08	4.78	4.31
12	12-Nov-01	16:54	~ 03-Dec-01	14:27	0.85	0.50	3.52	3.44	3.04	2.24	0.00	6.29	6.45
13	03-Dec-01	15:08	~ 27-Dec-01	9:38	2.69	1.39	2.47	2.44	2.09	4.78	4.35	3.35	3.63
14	27-Dec-01	15:01	~ 21-Jan-02	9:04	0.00	0.00	1.88	2.36	0.44	2.97	6.55	3.60	4.19
15	21-Jan-02	14:18	~ 12-Feb-02	10:33	1.42	1.91	2.72	2.90	2.43	0.00	5.49	4.28	4.06
16	12-Feb-02	14:36	~ 01-Mar-02	10:54	7.44	3.35	4.59	3.55	0.77	0.00	5.86	4.05	3.38
17	01-Mar-02	14:53	~ 20-Mar-02	10:23	18.2	1.30	10.6	4.72	3.94	0.00	4.30	4.32	6.74
18	20-Mar-02	17:05	~ 01-Apr-02	13:12	13.7	6.59	8.69	9.60	8.00	4.81	4.37	1.72	0.99
19	01-Apr-02	14:55	~ 08-Apr-02	13:38	7.77	4.80	8.34	8.44	6.71	4.49	5.83	8.16	7.35
20	08-Apr-02	14:19	~ 12-Apr-02	13:40	5.74	3.77	16.9	30.0	28.5	6.92	5.13	2.47	0.74
21	12-Apr-02	14:08	~ 17-Apr-02	10:23	0.00	6.69	9.32	9.98	6.08	0.00	4.76	3.55	1.37
22	17-Apr-02	10:59	~ 24-Apr-02	10:33	8.29	6.43	9.70	12.2	10.6	4.53	2.53	2.14	2.00
23	24-Apr-02	14:29	~ 08-May-02	9:47	4.92	2.56	1.23	1.58	2.45	2.15	2.77	2.56	2.44
24	08-May-02	10:27	~ 21-May-02	10:50	1.55	0.90	1.66	0.09	1.21	2.00	0.00	1.87	2.11
25	21-May-02	11:50	~ 11-Jun-02	10:11	4.87	1.65	3.94	3.20	2.79	1.55	5.90	5.30	4.75
26	11-Jun-02	17:39	~ 01-Jul-02	9:38	0.00	0.87	0.66	0.00	1.02	0.82	3.57	2.50	1.93
27	01-Jul-02	14:15	~ 22-Jul-02	10:32	1.19	0.00	1.52	2.11	2.08	2.68	0.00	2.94	2.92
28	22-Jul-02	11:12	~ 13-Aug-02	10:45	2.71	1.45	3.18	2.90	2.62	0.00	4.50	3.76	2.80
29	13-Aug-02	13:37	~ 02-Sep-02	10:02	2.03	1.34	2.18	2.90	0.05	2.04	3.10	2.20	2.67
30	02-Sep-02	14:04	~ 01-Oct-02	10:21	1.35	1.10	2.86	1.83	0.00	2.09	2.02	3.43	3.35
31	01-Oct-02	11:11	~ 21-Oct-02	10:12	2.14	1.77	1.75	0.32	3.72	3.84	5.62	4.00	4.36
32	21-Oct-02	14:08	~ 01-Nov-02	9:54	0.73	0.00	2.06	1.04	0.32	0.00	2.38	0.48	0.00
33	01-Nov-02	14:04	~ 21-Nov-02	9:48	0.00	2.28	3.80	3.43	2.81	2.41	3.40	4.09	0.00
34	21-Nov-02	11:06	~ 11-Dec-02	10:38	0.99	1.31	2.04	1.99	0.00	1.55	5.96	1.97	4.31
35	11-Dec-02	11:36	~ 27-Dec-02	10:25	1.77	2.08	4.40	2.20	0.00	0.00	0.00	2.14	0.00
36	27-Dec-02	15:07	~ 15-Jan-03	15:07	2.16	1.24	0.14	0.48	1.77	2.48	5.13	2.49	4.13
37	13-Feb-03	10:27	~ 03-Mar-03	10:41	2.59	1.36	1.43	3.26	2.33	2.78	1.36	2.18	3.56
38	03-Mar-03	10:45	~ 14-Mar-03	10:20	3.82	0.25	0.38	1.01	1.07	1.07	0.00	0.98	2.14
39	14-Mar-03	11:42	~ 25-Mar-03	10:20	4.51	0.04	2.20	1.95	0.87	0.00	6.57	0.65	3.54
40	25-Mar-03	13:38	~ 07-Apr-03	9:52	5.43	2.29	1.09	0.00	2.92	3.29	8.46	2.06	5.16
41	07-Apr-03	11:00	~ 21-Apr-03	10:09	1.21	1.04	3.34	4.62	4.01	1.99	0.09	2.55	5.76
42	21-Apr-03	14:32	~ 12-May-03	10:02	5.09	2.49	2.82	3.48	2.94	2.83	5.35	3.89	5.58
43	12-May-03	11:24	~ 02-Jun-03	9:29	2.25	1.11	2.87	2.59	2.35	3.27	7.10	2.84	4.42
44	02-Jun-03	11:38	~ 20-Jun-03	9:46	1.92	1.44	2.34	3.07	3.12	4.90	8.13	1.63	5.33
45	20-Jun-03	13:58	~ 11-Jul-03	8:59	0.84	0.66	1.05	2.36	1.81	1.97	5.25	0.93	3.27
46	11-Jul-03	10:30	~ 31-Jul-03	9:41	0.00	0.85	1.28	0.77	1.32	1.95	3.63	0.59	3.07
47	31-Jul-03	16:00	~ 21-Aug-03	13:42	0.95	1.12	1.30	1.88	1.87	0.00	3.03	0.42	2.10
48	21-Aug-03	14:17	~ 16-Sep-03	9:24	2.62	2.15	3.08	1.89	1.95	2.45	3.53	1.97	5.17
49	16-Sep-03	10:04	~ 30-Sep-03	10:22	1.45	1.58	2.05	2.56	1.80	1.44	2.22	0.77	4.24
50	30-Sep-03	13:40	~ 21-Oct-03	10:13	1.89	0.64	2.20	2.45	1.52	1.09	2.58	0.94	4.89
51	21-Oct-03	13:52	~ 11-Nov-03	9:28	0.71	7.30	0.87	2.72	2.50	3.89	5.86	0.67	4.56
52	11-Nov-03	13:53	~ 01-Dec-03	10:22	0.15	1.56	2.16	2.36	1.93	2.24	3.81	0.51	3.96
53	01-Dec-03	11:35	~ 12-Dec-03	10:14	0.00	0.09	3.88	2.58	2.98	3.74	7.13	0.83	7.51
54	22-Dec-03	16:01	~ 16-Jan-04	16:40	4.32	1.79	3.25	2.52	2.24	2.55	4.89	0.89	4.36
55	22-Jan-04	13:55	~ 10-Feb-04	9:26	2.06	1.63	2.39	0.94	1.27	1.59	3.74	2.80	1.53
56	10-Feb-04	10:25	~ 01-Mar-04	14:23	11.3	1.13	5.65	4.87	2.94	1.84	4.04	3.60	1.76
57	01-Mar-04	15:31	~ 19-Mar-04	0:00	15.1	5.16	5.71	0.00	4.37	2.78	3.90	1.58	0.21
58	19-Mar-04	14:31	~ 29-Mar-04	9:14	0.58	0.00	0.00	1.63	1.96	0.00	5.09	2.11	0.53
59	29-Mar-04	9:53	~ 08-Apr-04	13:41	3.41	0.72	2.75	3.00	3.53	1.81	1.18	1.88	1.26
60	08-Apr-04	16:23	~ 16-Apr-04	9:30	3.34	2.67	0.00	5.38	4.01	3.50	8.59	0.00	2.04
61	16-Apr-04	10:42	~ 26-Apr-04	9:37	9.79	4.56	7.49	6.53	4.83	1.77	2.02	2.93	1.95
62	26-Apr-04	11:03	~ 11-May-04	10:04	1.94	0.00	0.26	0.30	0.77	1.12	1.53	1.36	-
63	11-May-04	11:18	~ 01-Jun-04	11:15	5.00	2.00	2.82	2.00	1.88	1.67	1.69	3.61	3.38
64	01-Jun-04	17:20	~ 21-Jun-04	9:38	1.72	1.28	2.01	2.31	1.67	2.09	0.41	2.00	1.80
65	21-Jun-04	10:47	~ 12-Jul-04	9:35	2.81	2.03	2.96	3.72	2.73	2.85	4.03	3.27	2.88
66	12-Jul-04	11:19	~ 02-Aug-04	10:18	2.34	1.91	2.79	2.85	2.32	1.35	1.60	3.59	2.45
67	02-Aug-04	14:46	~ 20-Aug-04	10:03	1.34	0.84	2.51	2.96	2.76	1.97	4.73	3.16	2.66
68	20-Aug-04	11:15	~ 10-Sep-04	10:41	2.14	1.60	2.60	3.33	2.69	1.44	3.10	2.39	2.25
69	10-Sep-04	14:05	~ 01-Oct-04	14:56	3.35	0.93	2.96	3.24	0.77	6.54	2.80	1.82	1.91
70	01-Oct-04	16:50	~ 21-Oct-04	9:57	0.21	0.67	1.65	1.79	1.17	1.90	3.63	2.66	2.22

Appendix 2 (continue).

71	21-Oct-04	16:00 ~ 11-Nov-04	10:52	1.45	1.51	2.43	2.97	2.64	1.40	6.43	3.82	3.74
72	11-Nov-04	16:42 ~ 02-Dec-04	10:00	0.05	0.73	2.03	1.66	1.60	2.48	6.76	4.95	4.50
73	02-Dec-04	14:28 ~ 22-Dec-04	13:03	1.53	1.28	2.22	2.35	2.03	2.30	6.52	3.93	2.14
74	24-Dec-04	14:50 ~ 12-Jan-05	14:10	0.30	0.00	0.00	0.48	0.00	0.00	3.88	1.85	2.38
75	21-Jan-05	16:14 ~ 10-Feb-05	15:39	0.00	0.74	1.27	1.62	0.92	2.76	5.55	3.94	3.40
76	10-Feb-05	17:34 ~ 01-Mar-05	10:01	1.47	1.23	0.00	1.92	1.79	1.30	3.38	3.41	3.09
77	01-Mar-05	16:50 ~ 22-Mar-05	9:15	8.29	2.35	3.38	3.07	2.73	3.65	6.12	5.30	3.37

(2) Nagoya

No.	start		end		aeolian dust concentration ($\mu\text{g}/\text{m}^3$)								backup filter
	date	time	date	time	stage 0	stage 1	stage 2	stage 3	stage 4	stage 5	stage 6	stage 7	
1	08-Mar-01	15:45	~ 22-Mar-01	11:10	8.69	6.77	11.4	11.6	9.26	6.41	8.62	7.68	8.25
2	27-Mar-01	17:20	~ 24-Apr-01	15:20	5.59	3.44	6.47	7.15	3.77	3.85	5.63	6.07	5.89
3	28-Apr-01	15:15	~ 16-May-01	13:21	2.74	2.16	2.92	4.01	3.25	2.07	4.38	4.92	4.31
4	19-May-01	12:45	~ 01-Jun-01	9:55	3.26	2.86	4.02	4.84	4.40	3.45	5.91	6.10	4.93
5	07-Jun-01	11:36	~ 21-Jun-01	18:35	2.25	1.48	1.99	2.46	2.23	3.69	7.49	8.47	4.96
6	25-Jun-01	15:03	~ 09-Jul-01	11:30	2.82	1.79	2.04	2.46	2.23	1.97	5.08	5.54	3.88
7	18-Aug-01	14:52	~ 04-Sep-01	18:04	1.22	0.83	1.55	2.15	2.12	2.13	5.04	6.62	5.56
8	17-Sep-01	14:10	~ 02-Oct-01	13:23	3.90	3.39	3.84	4.10	3.93	2.90	5.12	7.97	6.16
9	04-Oct-01	14:20	~ 22-Oct-01	15:01	0.39	0.08	1.05	2.31	2.42	2.30	6.68	9.98	8.14
10	25-Oct-01	13:56	~ 07-Nov-01	14:35	2.83	2.83	4.56	3.86	3.15	4.80	6.84	6.25	6.39
11	09-Nov-01	12:05	~ 26-Nov-01	16:50	2.13	0.98	2.94	3.04	2.37	3.17	5.17	6.02	6.28
12	04-Dec-01	15:30	~ 19-Dec-01	15:20	2.11	1.91	2.21	2.24	2.03	2.16	3.04	1.80	2.78
13	01-Feb-02	15:45	~ 15-Feb-02	13:25	2.28	1.99	3.23	2.91	2.84	2.59	4.39	5.37	4.89
14	15-Feb-02	19:30	~ 01-Mar-02	11:30	1.85	1.81	2.85	3.09	2.77	2.77	5.12	5.87	5.08
15	04-Mar-02	12:53	~ 18-Mar-02	12:43	4.17	3.37	5.45	7.96	5.89	4.42	6.16	6.19	5.45
16	18-Mar-02	15:40	~ 02-Apr-02	12:17	5.09	4.51	10.1	14.0	11.2	5.20	4.38	6.21	5.75
17	02-Apr-02	17:59	~ 08-Apr-02	8:56	6.15	3.75	7.72	7.11	6.07	3.97	4.80	9.51	8.99
18	08-Apr-02	10:37	~ 12-Apr-02	12:36	9.02	7.63	24.6	40.7	33.1	12.6	6.79	10.4	10.5
19	12-Apr-02	14:55	~ 15-Apr-02	15:32	7.79	4.30	8.84	12.3	11.9	6.33	7.87	23.0	13.7
20	16-Apr-02	15:59	~ 21-Apr-02	10:59	6.61	6.76	12.4	15.7	12.9	5.99	5.63	8.19	8.04
21	22-Apr-02	17:26	~ 08-May-02	13:32	3.01	2.51	4.46	4.99	3.98	2.97	4.12	5.36	4.74
22	-	-	-	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-	-	-
24	09-May-02	12:26	~ 22-May-02	13:15	2.79	1.68	2.88	2.99	3.61	3.93	6.51	3.73	2.28
25	22-May-02	18:14	~ 05-Jun-02	14:53	4.90	3.58	4.96	4.28	0.00	5.67	7.13	5.29	3.58
26	06-Jun-02	11:28	~ 21-Jun-02	10:22	3.12	2.58	3.45	3.50	3.18	3.58	7.25	5.07	2.77
27	22-Jun-02	14:43	~ 05-Jul-02	13:56	0.72	0.11	3.08	1.44	2.04	2.33	2.90	5.05	6.43
28	06-Jul-02	14:15	~ 20-Jul-02	14:06	1.86	1.82	2.75	3.28	3.17	2.14	2.30	2.70	2.68
29	22-Jul-02	17:03	~ 06-Aug-02	11:55	2.90	2.04	3.02	2.56	2.56	3.22	6.70	9.64	7.83
30	08-Aug-02	14:23	~ 22-Aug-02	11:33	2.76	1.86	3.11	2.51	1.93	0.97	1.93	4.88	4.74
31	23-Aug-02	17:43	~ 05-Sep-02	12:26	2.13	1.67	3.03	3.44	2.59	2.04	4.17	4.61	3.73
32	05-Sep-02	16:55	~ 20-Sep-02	12:48	2.22	1.41	2.75	2.78	2.10	2.20	4.12	3.44	3.03
33	31-Oct-02	15:12	~ 05-Nov-02	16:50	3.83	3.87	5.47	5.37	3.83	3.20	8.09	6.25	6.68
34	07-Nov-02	14:47	~ 13-Nov-02	19:50	4.58	3.75	7.39	8.73	7.19	4.31	5.18	5.65	5.57
35	14-Nov-02	14:16	~ 28-Nov-02	14:21	2.98	1.49	2.12	2.63	2.35	2.44	4.61	5.87	4.84
36	29-Nov-02	14:20	~ 12-Dec-02	16:01	2.52	1.82	2.80	3.14	2.53	2.97	5.26	5.80	5.11
37	13-Dec-02	12:06	~ 26-Dec-02	15:03	2.71	2.17	3.16	2.75	2.00	3.38	5.93	6.43	6.08
38	27-Dec-02	14:22	~ 04-Jan-03	13:55	1.20	3.57	1.48	2.31	1.60	2.03	3.72	4.61	2.98
39	04-Jan-03	16:28	~ 15-Jan-03	13:39	2.75	1.65	1.04	1.98	1.76	2.32	3.13	5.12	4.44
40	16-Jan-03	16:26	~ 29-Jan-03	11:26	2.01	1.38	2.01	2.15	3.72	2.76	5.03	5.35	4.59
41	29-Jan-03	12:53	~ 13-Feb-03	15:10	2.94	1.37	2.00	1.79	0.67	2.02	4.84	4.57	4.18
42	14-Feb-03	14:58	~ 28-Feb-03	10:50	2.93	1.70	2.45	2.36	2.15	2.66	5.02	4.26	3.23
43	28-Feb-03	18:22	~ 13-Mar-03	13:47	2.91	0.42	1.78	2.28	1.72	1.72	2.89	2.97	3.62
44	14-Mar-03	17:23	~ 25-Mar-03	10:52	3.75	2.08	2.61	3.16	2.59	3.11	6.54	6.98	5.72
45	25-Mar-03	12:11	~ 07-Apr-03	13:27	3.95	2.03	4.00	4.21	3.23	3.59	6.19	6.90	4.34
46	07-Apr-03	15:55	~ 21-Apr-03	16:35	5.06	2.96	4.27	5.88	5.27	3.17	6.52	7.31	5.63
47	22-Apr-03	13:52	~ 08-May-03	15:06	3.26	2.03	3.64	3.76	3.41	3.29	4.85	6.45	4.83
48	09-May-03	14:31	~ 22-May-03	13:09	2.64	1.65	3.15	3.19	3.56	4.68	8.87	9.29	5.82
49	23-May-03	14:13	~ 05-Jun-03	13:58	3.17	2.47	3.78	4.25	3.48	2.12	7.50	9.11	6.56
50	06-Jun-03	15:07	~ 19-Jun-03	15:45	3.05	1.60	2.66	2.56	2.15	2.83	5.92	7.54	5.78
51	20-Jun-03	16:15	~ 03-Jul-03	14:18	1.98	1.20	2.17	2.91	2.22	4.98	7.64	7.71	7.01
52	04-Jul-03	14:23	~ 17-Jul-03	15:21	0.62	0.56	0.88	0.96	0.73	0.55	1.28	8.84	4.78
53	18-Jul-03	14:25	~ 30-Jul-03	16:20	1.73	1.30	2.93	2.19	0.00	2.11	3.86	4.83	4.29
54	01-Aug-03	14:39	~ 08-Aug-03	11:24	2.79	1.47	2.86	2.50	2.18	3.00	6.54	4.54	4.04
55	11-Aug-03	12:10	~ 19-Aug-03	11:45	1.88	0.89	4.52	2.00	0.83	1.94	3.32	3.66	3.41
56	20-Aug-03	13:43	~ 09-Sep-03	11:12	2.70	1.95	3.29	3.33	2.66	3.27	6.23	7.36	4.98
57	11-Sep-03	14:14	~ 25-Sep-03	14:04	2.54	1.89	2.81	2.88	2.70	2.75	5.16	5.52	4.33
58	25-Sep-03	17:08	~ 08-Oct-03	14:23	3.05	2.06	2.88	1.75	2.04	2.04	3.14	3.85	4.09
59	09-Oct-03	14:23	~ 22-Oct-03	14:16	2.30	2.10	3.12	2.83	2.45	2.55	4.87	6.04	5.61
60	22-Oct-03	15:04	~ 06-Nov-03	15:29	2.70	1.94	3.51	4.00	3.40	3.64	7.30	6.80	5.44
61	06-Nov-03	16:13	~ 21-Nov-03	14:20	1.25	1.15	1.86	2.27	2.30	2.12	3.63	4.05	9.00
62	21-Nov-03	15:21	~ 05-Dec-03	14:02	1.69	0.70	2.11	2.78	2.15	1.67	4.75	1.65	4.17

Appendix 2 (continue).

(3) Fukuoka

No.	start		end		aeolian dust concentration ($\mu\text{g}/\text{m}^3$)										backup filter
	date	time	date	time	stage 0	stage 1	stage 2	stage 3	stage 4	stage 5	stage 6	stage 7			
1	17-May-01	11:45	~ 24-May-01	10:30	6.36	7.77	5.65	7.42	9.54	2.83	5.65	6.71	5.65		
2	24-May-01	11:11	~ 31-May-01	10:08	4.23	2.47	3.17	3.53	3.88	3.88	10.2	7.41	2.12		
3	01-Jun-01	11:11	~ 07-Jun-01	10:20	4.53	4.94	0.41	6.58	0.41	5.76	8.64	6.58	5.76		
4	07-Jun-01	14:39	~ 14-Jun-01	10:31	0.36	1.80	4.67	5.39	1.80	2.52	10.8	11.5	6.47		
5	14-Jun-01	13:54	~ 19-Jun-01	14:00	2.45	2.45	1.47	6.37	0.00	3.43	1.47	0.49	0.98		
6	20-Jun-01	13:58	~ 27-Jun-01	10:37	1.07	1.07	1.07	3.58	2.50	1.43	1.43	4.29	3.58		
7	27-Jun-01	18:57	~ 04-Jul-01	10:48	1.11	1.47	0.74	0.00	4.79	0.74	2.58	3.68	1.47		
8	04-Jul-01	14:23	~ 11-Jul-01	11:10	0.36	0.00	0.36	0.00	2.14	0.00	1.79	5.72	3.22		
9	11-Jul-01	14:18	~ 19-Jul-01	9:14	2.52	1.58	0.00	0.00	0.32	0.32	0.63	3.15	0.63		
10	19-Jul-01	13:16	~ 26-Jul-01	11:00	0.36	1.42	3.20	1.78	0.71	3.55	1.78	6.04	3.91		
11	26-Jul-01	16:26	~ 02-Aug-01	13:02	2.15	1.07	2.86	5.01	2.15	2.50	7.16	10.7	8.23		
12	02-Aug-01	16:51	~ 09-Aug-01	10:25	-	-	-	-	-	-	-	-	-		
13	09-Aug-01	12:51	~ 23-Aug-01	11:31	1.23	0.70	1.94	2.99	2.64	0.00	3.17	5.10	4.05		
14	24-Aug-01	11:53	~ 31-Aug-01	17:23	2.72	0.34	0.34	0.34	2.38	2.38	6.45	17.0	4.75		
15	31-Aug-01	18:19	~ 07-Sep-01	10:40	0.00	0.00	0.00	5.88	0.73	0.00	0.00	3.31	4.04		
16	07-Sep-01	16:20	~ 14-Sep-01	10:03	4.01	0.73	3.28	1.09	1.09	0.00	0.73	3.28	2.19		
17	14-Sep-01	20:14	~ 21-Sep-01	9:27	1.50	3.00	3.00	4.50	3.37	0.00	2.62	7.87	2.62		
18	22-Sep-01	17:13	~ 28-Sep-01	10:20	1.29	0.43	1.72	4.30	2.15	2.58	1.72	7.73	6.44		
19	28-Sep-01	14:11	~ 05-Oct-01	7:55	0.73	1.09	5.10	3.28	5.46	0.73	1.82	5.83	4.37		
20	05-Oct-01	14:33	~ 12-Oct-01	10:30	3.95	2.16	2.87	3.95	3.23	2.51	6.83	7.54	5.03		
21	12-Oct-01	15:55	~ 19-Oct-01	10:25	3.26	2.17	3.26	1.45	2.17	1.09	3.26	6.52	7.61		
22	19-Oct-01	13:59	~ 26-Oct-01	11:51	2.13	1.78	1.42	2.84	4.26	2.13	3.20	4.62	4.26		
23	26-Oct-01	14:26	~ 02-Nov-01	10:05	1.80	1.80	2.52	2.88	2.52	7.20	7.56	8.64	6.48		
24	02-Nov-01	15:00	~ 09-Nov-01	10:05	1.08	1.44	3.25	2.17	5.06	1.44	2.53	2.17	1.08		
25	09-Nov-01	18:00	~ 16-Nov-01	12:03	3.27	1.09	0.73	1.09	3.27	2.18	1.09	4.72	4.72		
26	26-Nov-01	14:25	~ 03-Dec-01	11:00	2.15	0.00	2.50	2.15	1.43	0.72	4.29	8.23	3.94		
27	04-Dec-01	14:40	~ 27-Dec-01	13:06	1.28	0.86	2.25	2.78	2.46	1.50	2.25	4.28	4.07		
28	28-Dec-01	17:28	~ 17-Jan-02	11:40	3.48	1.99	3.85	4.72	5.34	3.23	4.60	6.71	4.35		
29	21-Jan-02	12:50	~ 12-Feb-02	10:42	-	-	-	-	-	-	-	-	-		
30	14-Feb-02	10:38	~ 01-Mar-02	10:10	3.60	2.46	3.60	3.77	3.44	3.28	5.08	8.35	5.57		
31	01-Mar-02	12:28	~ 22-Mar-02	11:24	7.03	5.50	11.5	19.2	17.6	7.61	7.73	7.03	4.10		
32	22-Mar-02	16:11	~ 05-Apr-02	19:00	7.23	8.00	8.19	12.9	10.9	4.22	3.22	4.00	4.08		
33	06-Apr-02	9:15	~ 11-Apr-02	15:36	10.3	17.0	37.3	46.7	53.4	17.9	6.95	7.32	7.55		
34	12-Apr-02	11:34	~ 16-Apr-02	12:39	1.64	0.00	6.13	14.9	6.43	0.00	18.8	18.0	0.73		
35	17-Apr-02	10:37	~ 25-Apr-02	9:03	5.57	5.44	5.91	6.96	5.23	5.32	1.95	5.10	12.2		
36	25-Apr-02	9:05	~ 10-May-02	17:50	7.87	0.00	1.55	4.58	1.50	0.00	2.95	5.59	3.51		
37	10-May-02	21:08	~ 31-May-02	13:17	3.03	1.06	2.40	3.66	2.88	2.81	3.96	6.65	4.14		
38	31-May-02	18:52	~ 20-Jun-02	12:46	3.09	2.30	2.75	4.55	3.91	5.51	13.3	10.8	14.1		
39	21-Jun-02	17:47	~ 11-Jul-02	16:23	1.40	1.32	1.58	3.21	1.85	0.85	2.14	3.37	2.66		
40	12-Jul-02	17:02	~ 30-Jul-02	10:44	0.00	1.88	0.36	2.19	4.00	0.00	2.99	4.43	4.34		
41	30-Jul-02	15:12	~ 21-Aug-02	11:30	1.44	0.00	0.03	2.89	1.43	0.07	1.77	3.59	2.02		
42	21-Aug-02	16:17	~ 11-Sep-02	10:50	1.58	0.71	2.07	0.69	2.82	0.00	3.26	4.94	4.47		
43	11-Sep-02	16:55	~ 10-Oct-02	13:22	3.33	2.04	3.10	3.84	3.50	2.57	6.04	6.26	3.36		
44	10-Oct-02	16:25	~ 24-Oct-02	17:08	0.23	1.80	1.29	4.34	4.90	2.20	5.32	8.08	5.02		
45	21-Nov-02	18:09	~ 10-Dec-02	14:09	2.45	0.31	0.63	3.17	3.43	1.25	3.41	4.18	3.44		
46	31-Dec-02	11:05	~ 22-Jan-03	15:36	1.11	0.88	2.65	3.10	2.99	3.10	6.86	5.97	3.10		
47	23-Jan-03	19:30	~ 10-Feb-03	15:42	2.06	0.00	1.65	2.34	0.00	1.65	3.85	4.95	2.34		
48	10-Feb-03	17:28	~ 03-Mar-03	17:18	9.41	0.00	0.00	4.15	2.56	1.73	13.4	15.2	12.4		
49	04-Mar-03	16:10	~ 14-Mar-03	16:56	2.94	2.20	3.42	0.00	2.20	1.96	1.47	2.69	2.45		
50	15-Mar-03	11:47	~ 25-Mar-03	13:15	3.32	1.46	2.12	3.00	0.00	1.32	3.61	5.22	2.22		
51	25-Mar-03	19:10	~ 07-Apr-03	13:24	6.77	3.88	4.88	3.96	3.90	3.25	7.62	8.31	3.06		
52	07-Apr-03	19:05	~ 21-Apr-03	13:47	4.29	1.85	4.92	5.32	5.08	2.37	3.92	5.20	1.83		
53	21-Apr-03	23:30	~ 10-May-03	13:16	4.17	3.20	5.84	6.20	4.77	3.40	5.13	5.75	3.16		
54	10-May-03	19:40	~ 30-May-03	13:40	3.58	2.89	3.70	3.76	3.45	5.18	8.56	7.58	4.70		
55	31-May-03	13:45	~ 23-Jun-03	15:55	2.14	1.70	2.28	3.25	2.31	2.95	7.95	7.38	3.43		
56	24-Jun-03	21:55	~ 10-Jul-03	13:18	0.52	0.86	0.39	1.63	2.29	1.87	4.71	5.91	4.17		
57	11-Jul-03	5:50	~ 30-Jul-03	13:26	1.71	1.31	1.71	2.24	1.56	0.91	2.64	0.83	11.2		
58	30-Jul-03	21:07	~ 20-Aug-03	18:00	0.63	0.42	1.65	3.49	2.00	0.98	4.89	5.67	2.48		
59	21-Aug-03	8:57	~ 11-Sep-03	17:40	2.27	2.08	2.75	3.41	2.57	1.73	4.24	5.10	3.18		
60	12-Sep-03	18:25	~ 30-Sep-03	11:16	1.44	1.76	1.91	3.12	1.32	1.94	8.21	5.85	2.02		
61	30-Sep-03	22:31	~ 20-Oct-03	13:24	3.93	1.65	3.13	2.66	1.91	1.89	1.93	4.33	3.75		
62	21-Oct-03	17:19	~ 10-Nov-03	16:30	4.42	3.72	5.60	3.53	2.86	3.11	4.42	6.55	4.46		
63	11-Nov-03	15:38	~ 30-Nov-03	15:19	2.08	0.00	2.53	3.17	2.96	2.04	1.98	2.97	2.04		
64	30-Nov-03	19:20	~ 20-Dec-03	15:30	1.11	0.84	1.71	2.24	1.15	1.08	2.16	3.50	5.27		
65	21-Dec-03	12:05	~ 09-Jan-04	15:45	1.59	1.54	4.77	5.45	4.75	3.18	7.57	7.51	3.68		
66	10-Jan-04	14:04	~ 30-Jan-04	9:00	1.80	1.35	1.65	2.27	1.18	0.99	2.99	3.71	1.97		
67	30-Jan-04	17:45	~ 20-Feb-04	15:30	3.62	4.00	7.20	6.42	3.11	2.09	3.89	5.11	3.65		
68	23-Feb-04	23:24	~ 10-Mar-04	14:27	3.63	3.14	5.29	3.89	3.12	1.76	2.98	4.26	2.32		
69	10-Mar-04	19:26	~ 20-Mar-04	16:38	6.38	6.23	13.1	13.9	8.34	2.68	3.03	2.41	1.64		

Appendix 2 (continue).

70	20-Mar-04	20:53 ~ 28-Mar-04	16:17	1.85	0.00	0.00	1.92	1.57	0.91	1.89	6.07	3.99
71	28-Mar-04	20:56 ~ 08-Apr-04	13:53	1.42	7.15	6.88	6.33	3.74	0.00	1.60	4.54	0.92
72	08-Apr-04	19:32 ~ 16-Apr-04	11:40	4.96	4.25	4.73	5.09	2.56	3.36	4.54	4.54	3.04
73	17-Apr-04	16:56 ~ 26-Apr-04	15:00	3.99	3.33	5.58	4.76	4.65	0.52	3.30	6.25	5.39
74	26-Apr-04	20:56 ~ 10-May-04	16:58	1.53	1.56	3.88	3.78	3.96	1.12	2.02	7.20	3.80
75	10-May-04	20:08 ~ 31-May-04	18:08	3.05	1.71	2.29	3.46	2.59	1.45	5.37	5.71	2.42
76	01-Jun-04	18:57 ~ 21-Jun-04	18:03	1.48	1.75	0.96	2.37	2.47	1.03	2.11	4.78	4.51
77	21-Jun-04	23:19 ~ 11-Jul-04	16:05	1.54	0.83	1.03	1.62	2.72	3.29	5.63	5.29	10.83
78	13-Jul-04	0:15 ~ 31-Jul-04	11:24	1.36	1.38	0.85	2.58	1.18	1.45	3.23	3.24	1.58
79	31-Jul-04	20:43 ~ 20-Aug-04	13:47	1.20	0.05	0.52	2.15	0.00	0.67	3.17	4.61	2.69
80	20-Aug-04	20:17 ~ 11-Sep-04	21:30	0.17	0.79	2.36	3.78	2.77	2.33	4.47	5.48	2.69
81	12-Sep-04	14:35 ~ 01-Oct-04	13:58	0.54	1.10	1.81	2.06	1.58	0.70	1.88	2.82	1.91
82	02-Oct-04	10:59 ~ 21-Oct-04	11:26	4.37	1.63	2.84	2.63	2.39	0.39	0.93	2.88	1.77
83	21-Oct-04	15:41 ~ 10-Nov-04	13:01	1.28	1.37	2.75	2.86	1.44	2.95	5.66	6.12	4.38
84	10-Nov-04	17:50 ~ 30-Nov-04	15:04	6.01	0.57	2.22	2.65	2.33	0.00	4.58	5.34	4.25
85	01-Dec-04	0:05 ~ 20-Dec-04	16:30	12.1	2.64	4.20	4.44	0.00	0.00	5.96	5.58	3.54
86	21-Dec-04	15:06 ~ 10-Jan-05	19:31	1.28	0.00	0.92	0.00	0.00	0.00	2.40	2.43	0.85
87	12-Jan-05	1:02 ~ 31-Jan-05	15:00	4.92	1.74	4.61	0.46	2.56	0.00	3.62	4.65	2.54
88	02-Feb-05	16:56 ~ 20-Feb-05	12:15	0.00	0.00	2.37	2.19	1.35	1.39	2.47	4.37	2.44
89	20-Feb-05	16:57 ~ 10-Mar-05	13:07	3.67	2.75	4.51	3.74	4.13	1.83	4.91	5.54	4.10
90	10-Mar-05	18:23 ~ 31-Mar-05	16:51	4.48	2.48	4.75	3.62	1.96	0.52	3.09	5.25	2.37

(4) Naha

No.	start		end		aeolian dust concentration ($\mu\text{g}/\text{m}^3$)								backup filter
	date	time	date	time	stage 0	stage 1	stage 2	stage 3	stage 4	stage 5	stage 6	stage 7	
1	23-Feb-01	13:45	~ 09-Mar-01	16:11	-	-	-	-	-	-	-	-	-
2	09-Mar-01	17:16	~ 23-Mar-01	18:16	-	-	-	-	-	-	-	-	-
3	31-May-01	9:20	~ 11-Jun-01	16:45	1.08	1.15	2.19	2.69	2.02	0.48	2.21	2.13	1.58
4	15-Jun-01	17:15	~ 25-Jun-01	17:20	1.69	1.52	3.34	4.98	2.72	1.20	0.47	1.77	2.18
5	28-Jun-01	17:30	~ 10-Jul-01	8:40	1.98	2.43	3.27	4.79	0.19	2.03	0.00	0.25	0.00
6	10-Jul-01	18:50	~ 19-Jul-01	17:00	0.00	0.00	0.00	1.10	2.50	0.71	0.69	5.28	0.00
7	19-Jul-01	8:51	~ 29-Jul-01	17:23	1.30	0.62	2.11	2.42	1.85	0.00	0.28	0.31	0.21
8	01-Aug-01	8:54	~ 12-Aug-01	9:32	0.00	0.00	0.00	3.07	0.00	3.14	8.43	4.43	0.71
9	19-Aug-01	15:50	~ 09-Sep-01	14:42	0.43	1.65	3.08	2.99	2.74	0.00	0.57	1.30	0.00
10	09-Sep-01	17:34	~ 30-Sep-01	17:01	1.08	1.75	2.97	3.73	2.32	1.29	0.00	0.41	0.00
11	02-Oct-01	17:34	~ 22-Oct-01	9:58	3.05	2.72	6.41	6.57	4.35	2.44	4.45	3.50	1.99
12	22-Oct-01	13:15	~ 11-Nov-01	16:00	2.76	2.81	4.93	5.27	3.04	1.18	3.01	7.19	1.46
13	12-Nov-01	9:00	~ 02-Dec-01	9:00	3.41	3.35	6.22	5.50	5.17	1.40	5.28	3.77	2.42
14	04-Dec-01	9:04	25-Dec-01	9:10	3.25	3.19	5.92	5.23	4.92	1.33	5.02	3.59	2.30
15	26-Dec-01	9:00	~ 15-Jan-02	8:56	2.41	3.55	13.2	7.44	4.61	3.73	5.74	5.76	3.62
16	15-Jan-02	17:24	~ 04-Feb-02	16:18	1.98	1.87	5.39	5.61	3.43	2.15	3.74	3.84	2.46
17	05-Feb-02	8:58	~ 25-Feb-02	16:30	3.54	3.94	7.32	6.50	4.86	2.37	4.66	4.01	2.94
18	26-Feb-02	11:40	~ 18-Mar-02	10:19	3.14	2.63	6.19	6.63	4.69	3.10	4.07	3.74	3.15
19	18-Mar-02	17:00	~ 07-Apr-02	7:33	3.67	3.93	11.0	13.4	9.34	4.44	3.14	3.88	2.58
20	07-Apr-02	9:50	~ 17-Apr-02	7:11	3.32	5.96	14.9	19.0	14.9	5.63	3.25	5.16	3.90
21	17-Apr-02	8:42	~ 24-Apr-02	17:02	0.00	0.00	6.85	4.04	11.6	0.00	3.24	4.48	4.31
22	25-Apr-02	8:20	~ 15-May-02	9:05	2.85	1.45	2.88	0.00	6.20	0.00	1.31	2.49	2.96
23	15-May-02	11:40	~ 04-Jun-02	8:58	1.36	0.89	5.33	5.11	3.53	2.22	2.59	3.83	2.69
24	04-Jun-02	13:15	~ 24-Jun-02	9:01	1.04	0.00	3.39	3.40	3.39	0.00	1.58	1.76	1.70
25	24-Jun-02	19:00	~ 15-Jul-02	9:01	1.55	2.41	5.15	5.75	4.47	1.79	1.05	1.51	1.50
26	15-Jul-02	11:59	~ 05-Aug-02	10:45	1.73	1.79	4.36	4.46	3.40	1.49	1.70	1.84	1.32
27	05-Aug-02	14:46	~ 23-Aug-02	10:35	1.80	1.62	3.57	3.23	2.04	0.98	1.49	1.20	1.07
28	23-Aug-02	15:27	~ 12-Sep-02	9:11	2.90	2.75	5.15	5.30	4.09	2.27	4.04	2.54	1.22
29	12-Sep-02	13:25	~ 02-Oct-02	13:58	2.39	2.57	4.98	4.45	2.94	2.65	5.98	3.93	1.92
30	02-Oct-02	16:28	~ 22-Oct-02	13:16	2.40	2.95	4.89	3.79	3.40	2.37	4.43	3.04	1.54
31	22-Oct-02	16:04	~ 11-Nov-02	9:36	3.56	3.54	5.56	5.80	3.33	2.24	3.67	2.10	1.70
32	11-Nov-02	12:00	~ 29-Nov-02	9:20	2.52	3.03	5.87	5.53	3.70	2.70	3.61	1.37	0.37
33	29-Nov-02	11:45	~ 19-Dec-02	16:53	2.51	2.49	4.83	3.57	2.80	2.61	3.02	2.33	1.35
34	19-Dec-02	18:58	~ 08-Jan-03	9:02	1.78	2.07	3.53	3.33	1.79	1.63	2.64	2.00	1.63
35	08-Jan-03	11:05	~ 28-Jan-03	15:48	2.78	3.38	5.60	5.11	3.75	3.92	6.75	4.43	2.59
36	28-Jan-03	18:05	~ 17-Feb-03	16:05	2.72	3.17	5.05	5.26	3.03	2.17	3.25	2.96	2.70
37	17-Feb-03	18:21	~ 07-Mar-03	8:41	3.01	3.30	5.70	6.33	4.20	2.66	3.21	3.07	2.05
38	07-Mar-03	10:59	~ 14-Mar-03	10:24	2.95	0.81	5.10	5.14	3.55	1.51	2.88	4.19	2.99
39	14-Mar-03	12:31	~ 25-Mar-03	9:34	3.84	3.54	5.84	6.14	3.93	2.66	3.27	3.00	2.62
40	25-Mar-03	12:00	~ 03-Apr-03	10:11	3.77	4.67	9.60	9.68	7.56	4.76	6.65	5.64	3.85
41	03-Apr-03	13:19	~ 21-Apr-03	8:54	2.67	2.92	4.31	4.74	3.55	2.30	4.39	4.90	3.32
42	21-Apr-03	10:56	~ 16-May-03	8:07	2.98	2.21	3.42	4.93	4.30	2.11	2.04	3.05	2.07
43	16-May-03	9:53	~ 05-Jun-03	10:16	2.08	2.00	3.18	3.53	2.91	2.27	4.88	3.95	1.59
44	05-Jun-03	12:34	~ 25-Jun-03	10:01	2.16	2.04	4.03	4.35	3.42	1.73	2.28	2.28	1.47
45	25-Jun-03	12:34	~ 15-Jul-03	14:46	2.59	2.03	3.00	2.60	1.55	0.72	0.57	0.07	0.15
46	15-Jul-03	16:51	~ 04-Aug-03	17:14	1.80	1.13	2.39	2.24	1.34	0.72	0.93	1.19	0.82
47	04-Aug-03	16:51	~ 22-Aug-03	8:05	2.37	2.28	3.78	4.20	3.21	1.47	1.20	1.17	0.67
48	29-Aug-03	17:32	~ 18-Sep-03	9:25	-	-	-	-	-	-	-	-	-

Appendix 2 (continue).

49	18-Sep-03	13:18	~ 14-Oct-03	13:28	2.87	2.69	4.51	4.93	3.20	1.69	2.56	1.68	1.09
50	24-Oct-03	17:05	~ 13-Nov-03	16:00	1.83	2.55	4.38	4.33	2.87	1.88	2.98	2.55	1.45
51	13-Nov-03	11:32	~ 03-Dec-03	13:07	2.84	3.25	5.74	5.22	3.50	1.97	2.43	2.15	1.04
52	03-Dec-03	14:50	~ 22-Dec-03	14:25	3.01	2.79	2.82	4.05	3.45	1.59	3.19	2.64	0.76
53	-												
54	09-Jan-04	11:11	~ 29-Jan-04	9:04		2.19	4.23	4.09	0.52	1.22	0.00	5.26	3.99
55	29-Jan-04	10:55	~ 18-Feb-04	9:34	3.61	3.09	6.45	4.11	0.00	1.94	3.70	5.27	4.37
56	18-Feb-04	11:52	~ 09-Mar-04	9:10	4.07	1.69	10.1	10.0	6.08	3.50	4.18	3.65	2.64
57	09-Mar-04	11:10	~ 18-Mar-04	11:00	2.84	2.78	3.36	2.81	1.64	1.36	1.39	7.04	7.04
58	18-Mar-04	13:50	~ 29-Mar-04	13:15	2.62	2.50	4.36	4.11	2.79	1.39	1.74	6.39	5.43
59	29-Mar-04	15:05	~ 08-Apr-04	13:13	3.68	4.25	8.88	9.05	7.77	4.06	3.59	5.79	4.95
60	08-Apr-04	15:15	~ 16-Apr-04	9:19	1.61	2.44	3.92	3.51	2.18	2.44	4.08	3.73	4.24
61	16-Apr-04	11:15	~ 26-Apr-04	9:07	16.6	3.84	6.61	6.86	4.80	3.14	6.61	6.83	4.09
62	26-Apr-04	11:05	~ 12-May-04	10:03	1.23	0.00	5.40	5.77	3.60	2.09	0.00	4.03	1.18
63	12-May-04	11:28	~ 01-Jun-04	9:10	0.99	1.69	2.96	2.98	2.19	1.15	1.43	2.50	2.23
64	01-Jun-04	11:05	~ 18-Jun-04	15:52	1.28	0.00	3.11	3.04	2.31	0.00	2.51	3.02	2.27
65	22-Jul-04	10:30	~ 12-Aug-04	9:45	0.60	1.38	2.40	2.68	2.13	1.21	1.37	1.15	0.81
66	12-Aug-04	11:42	~ 02-Sep-04	9:07	2.24	2.84	5.24	5.49	4.57	1.95	2.02	1.49	0.39
67	02-Sep-04	11:15	~ 22-Sep-04	10:55	0.69	1.60	3.84	3.81	1.88	1.55	12.1	0.95	0.44
68	22-Sep-04	13:40	~ 12-Oct-04	9:14	2.56	2.54	5.18	4.58	3.44	1.91	1.77	1.50	0.00
69	12-Oct-04	10:53	~ 01-Nov-04	9:17	3.74	2.41	5.52	5.53	4.37	0.85	2.40	1.53	0.87
70	01-Nov-04	11:20	~ 19-Nov-04	9:14	0.99	2.56	5.23	5.06	3.36	0.90	3.77	2.82	1.63
71	19-Nov-04	10:51	~ 01-Dec-04	9:03	3.21	3.02	5.89	5.66	3.42	2.00	4.28	2.72	0.60
72	-												
73	01-Dec-04	11:13	~ 20-Dec-04	13:42	2.38	1.72	2.48	4.12	2.56	0.78	1.44	0.68	0.82
74	20-Dec-04	15:00	~ 07-Jan-05	9:10	2.54	1.98	4.13	3.70	2.63	2.22	3.39	2.57	1.12
75	07-Jan-05	10:48	~ 27-Jan-05	9:10	1.90	2.46	4.46	3.95	2.31	1.95	3.99	2.88	1.56
76	27-Jan-05	9:12	~ 17-Feb-05	9:12	2.73	0.00	3.65	4.37	2.29	1.67	2.59	2.66	1.86
77	17-Feb-05	10:55	~ 09-Mar-05	9:20	2.52	2.40	4.20	3.69	2.65	1.86	2.76	4.38	3.47
78	09-Mar-05	11:07	~ 28-Mar-05	12:32	3.77	3.79	6.44	7.48	4.76	2.45	3.45	4.51	3.32

(5) Beijing

No.	start		end		aeolian dust concentration ($\mu\text{g}/\text{m}^3$)									backup filter
	date	time	date	time	stage 0	stage 1	stage 2	stage 3	stage 4	stage 5	stage 6	stage 7		
1	27-Feb-02	10:00	~ 04-Mar-02	10:00	27.5	19.6	31.4	27.5	16.7	25.5	26.0	11.8	15.2	
2	19-Mar-02	10:00	~ 21-Mar-02	10:00	189.	304.	205.	161.	103.	49.1	18.4	11.0	16.0	
3	08-Apr-02	9:30	~ 08-Apr-02	21:00	476.	261.	215.	118.	133.	102.	30.7	66.6	61.5	
4	11-Apr-02	18:15	~ 12-Apr-02	9:15	275.	120.	120.	113.	78.5	29.4	22.1	12.3	14.7	
5	14-Apr-02	13:30	~ 15-Apr-02	13:30	185.	86.4	110.	110.	94.2	55.0	31.4	11.8	7.85	
6	15-Apr-02	15:50	~ 16-Apr-02	15:50	196.	63.8	101.	98.2	68.7	31.9	17.2	9.82	2.45	
7	16-Apr-02	16:00	~ 17-Apr-02	10:00	134.	55.6	39.3	16.4	32.7	0.00	0.00	6.54	52.3	
8	17-Apr-02	10:30	~ 19-Apr-02	10:30	62.6	41.7	51.5	40.5	19.6	12.3	14.7	22.1	24.5	
9	21-Apr-02	9:40	~ 22-Apr-02	9:40	101.	41.7	44.2	31.9	24.5	34.4	36.8	7.36	7.36	
10	10-May-02	10:00	~ 12-May-02	10:00	41.7	25.8	29.4	22.1	9.82	42.9	47.9	22.1	28.2	
11	20-May-02	10:00	~ 23-May-02	10:00	65.4	36.0	38.4	31.1	17.2	14.7	13.1	16.4	16.4	
12	03-Jun-02	22:30	~ 07-Jun-02	10:30	23.1	11.9	22.4	21.7	16.8	14.0	16.1	30.1	76.4	
13	21-Jun-02	10:00	~ 23-Jun-02	16:00	12.0	5.45	12.0	7.63	6.54	7.63	14.2	8.72	8.72	
14	05-Jul-02	10:00	~ 08-Jul-02	10:00	32.7	25.4	34.4	25.4	15.5	11.5	0.00	6.54	4.91	
15	25-Jul-02	12:00	~ 28-Jul-02	10:00	22.7	14.3	22.7	16.0	8.41	5.89	9.25	2.52	5.89	
16	28-Jul-02	10:00	~ 31-Jul-02	10:00	22.1	13.1	20.4	19.6	15.5	24.5	25.4	8.18	4.91	
17	05-Aug-02	10:00	~ 08-Aug-02	10:00	22.9	14.7	19.6	13.1	6.54	4.09	6.54	9.82	11.5	
18	20-Aug-02	10:00	~ 22-Aug-02	10:00	19.6	31.9	28.2	29.4	20.9	25.8	38.0	22.1	11.0	
19	06-Sep-02	10:00	~ 08-Sep-02	10:00	54.0	35.6	54.0	39.3	20.9	18.4	29.4	12.3	13.5	
20	20-Sep-02	10:00	~ 22-Sep-02	10:00	23.3	13.5	23.3	20.9	7.36	9.82	12.3	17.2	11.0	
21	08-Oct-02	10:00	~ 10-Oct-02	10:00	42.9	33.1	45.4	45.4	30.7	47.9	61.3	42.9	18.4	
22	21-Oct-02	10:00	~ 23-Oct-02	10:00	16.0	6.13	12.3	9.82	7.36	7.36	12.3	12.3	8.59	
23	06-Nov-02	10:00	~ 08-Nov-02	10:00	24.5	16.0	16.0	13.5	7.36	9.82	12.3	7.36	7.36	
24	21-Nov-02	10:00	~ 23-Nov-02	10:00	30.7	22.1	38.0	31.9	27.0	45.4	55.2	44.2	35.6	
25	04-Dec-02	10:00	~ 06-Dec-02	10:00	47.9	38.0	57.7	56.4	39.3	14.7	14.7	2.45	9.82	
26	24-Dec-02	10:00	~ 26-Dec-02	10:00	18.4	4.91	2.45	2.45	1.23	2.45	2.45	2.45	8.59	
27	06-Jan-03	10:00	~ 08-Jan-03	10:00	24.5	17.2	24.5	23.3	18.4	23.3	25.8	14.7	27.0	
28	20-Jan-03	10:00	~ 22-Jan-03	10:00	13.5	11.0	23.3	18.4	19.6	29.4	35.6	19.6	24.5	
29	09-Feb-03	10:00	~ 11-Feb-03	10:00	30.7	18.4	16.0	12.3	4.91	4.91	4.91	7.36	7.36	
30	25-Feb-03	10:00	~ 27-Feb-03	10:00	24.5	19.6	24.5	22.1	19.6	25.8	34.4	19.6	22.1	
31	06-Mar-03	10:00	~ 08-Mar-03	10:00	27.0	16.0	20.9	18.4	8.59	16.0	24.5	19.6	19.6	
32	17-Mar-03	10:00	~ 19-Mar-03	10:00	17.2	16.0	24.5	17.2	13.5	22.1	27.0	16.0	13.5	
33	19-Mar-03	17:00	~ 21-Mar-03	10:00	11.5	7.18	10.1	8.62	7.18	15.8	20.1	18.7	12.9	
34	21-Mar-03	10:00	~ 23-Mar-03	10:00	34.4	33.1	42.9	34.4	20.9	25.8	35.6	24.5	23.3	
35	23-Mar-03	10:00	~ 25-Mar-03	10:00	27.0	24.5	36.8	30.7	24.5	38.0	36.8	25.8	24.5	
36	25-Mar-03	10:00	~ 27-Mar-03	10:00	47.9	22.1	28.2	19.6	12.3	9.82	9.82	8.59	14.7	
37	27-Mar-03	10:00	~ 29-Mar-03	10:00	30.7	19.6	27.0	19.6	9.82	16.0	8.6	22.1	34.4	
38	10-Apr-03	19:00	~ 12-Apr-03	19:00	65.0	29.4	39.3	36.8	30.7	36.8	44.2	31.9	16.0	

Appendix 2 (continue).

39	14-Apr-03	14:30	~ 15-Apr-03	14:30	115.	66.3	95.7	81.0	49.1	24.5	19.6	14.7	17.2
40	21-Apr-03	10:00	~ 23-Apr-03	10:00	49.1	19.6	19.6	17.2	14.7	23.3	35.6	23.3	19.6
41	06-May-03	10:00	~ 08-May-03	10:00	38.0	17.2	18.4	13.5	9.82	9.82	22.1	22.1	17.2
42	20-May-03	10:00	~ 22-May-03	10:00	42.9	25.8	30.7	23.3	14.7	17.2	27.0	25.8	13.5
43	04-Jun-03	10:00	~ 06-Jun-03	10:00	27.0	18.4	22.1	16.0	11.0	13.5	22.1	22.1	13.5
44	26-Jun-03	10:00	~ 28-Jun-03	10:00	7.4	4.91	13.5	9.82	3.68	9.82	20.9	19.6	11.0
45	04-Jul-03	10:00	~ 06-Jul-03	10:00	24.5	11.0	16.0	13.5	8.59	8.59	14.7	16.0	16.0
46	21-Jul-03	10:00	~ 23-Jul-03	10:00	13.5	7.36	13.5	12.3	12.3	30.7	34.4	11.0	6.1
47	05-Aug-03	10:00	~ 07-Aug-03	10:00	23.3	14.7	27.0	18.4	12.3	12.3	18.4	17.2	14.7
48	20-Aug-03	10:00	~ 22-Aug-03	10:00	44.2	30.7	38.0	25.8	16.0	23.3	28.2	22.1	14.7
49	09-Sep-03	10:00	~ 11-Sep-03	10:00	25.8	16.0	25.8	20.9	8.59	6.13	8.59	12.3	16.0
50	22-Sep-03	10:00	~ 24-Sep-03	10:00	27.0	17.2	23.3	16.0	7.36	12.3	24.5	24.5	12.3
51	09-Oct-03	10:00	~ 11-Oct-03	10:00	11.0	8.59	13.5	13.5	16.0	28.2	35.6	18.4	7.4
52	20-Oct-03	10:00	~ 22-Oct-03	10:00	62.6	30.7	31.9	25.8	17.2	20.9	27.0	17.2	12.3
53	05-Nov-03	10:00	~ 07-Nov-03	10:00	16.0	3.68	6.13	2.45	0.00	1.23	2.45	4.91	7.36
54	20-Nov-03	10:00	~ 22-Nov-03	10:00	23.3	16.0	24.5	17.2	83.4	11.0	13.5	7.36	11.0
55	04-Dec-03	10:00	~ 06-Dec-03	10:00	56.4	24.5	35.6	29.4	19.6	22.1	27.0	12.3	19.6
56	26-Dec-03	10:00	~ 28-Dec-03	10:00	25.8	23.3	33.1	28.2	16.0	17.2	20.9	14.7	24.5
57	05-Jan-04	10:00	~ 07-Jan-04	10:00	36.8	28.2	39.3	34.4	30.7	30.7	34.4	22.1	33.1
58	29-Jan-04	10:00	~ 31-Jan-04	10:00	25.8	20.9	27.0	25.8	19.6	30.7	34.4	24.5	22.1
59	10-Feb-04	10:00	~ 12-Feb-04	10:00	46.6	44.2	50.3	39.3	28.2	23.3	25.8	22.1	27.0
60	23-Feb-04	10:00	~ 25-Feb-04	10:00	93.2	41.7	55.2	46.6	34.4	30.7	34.4	20.9	9.82
61	08-Mar-04	10:00	~ 10-Mar-04	10:00	173.	92.0	123.	93.2	55.2	50.3	54.0	49.1	50.3
62	23-Mar-04	10:00	~ 25-Mar-04	10:00	29.4	16.0	19.6	13.5	7.36	6.13	9.82	9.82	12.3
63	28-Mar-04	10:00	~ 29-Mar-04	10:00	125.	83.4	118.	101.	68.7	39.3	17.2	9.8	4.9
64	29-Mar-04	14:30	~ 30-Mar-04	14:30	150.	54.0	39.3	19.6	17.2	12.3	12.3	14.7	27.0
65	07-Apr-04	10:00	~ 09-Apr-04	10:00	88.3	42.9	56.4	36.8	14.7	8.59	3.68	4.91	9.82
66	23-Apr-04	10:00	~ 25-Apr-04	10:00	99.4	56.4	68.7	50.3	27.0	17.2	20.9	34.4	33.1
67	10-May-04	10:00	~ 12-May-04	10:00	42.9	22.1	27.0	20.9	12.3	9.82	8.59	18.4	19.6
68	19-Jun-04	10:00	~ 21-Jun-04	10:00	23.3	20.9	24.5	19.6	22.1	45.4	56.4	50.3	36.8
69	20-Jul-04	10:00	~ 22-Jul-04	10:00	2.45	6.13	7.36	6.13	3.68	13.5	18.4	8.59	4.91
70	24-Aug-04	10:00	~ 26-Aug-04	10:00	16.0	14.7	19.6	17.2	19.6	35.6	46.6	20.9	9.82
71	27-Sep-04	10:00	~ 29-Sep-04	10:00	11.0	8.6	13.5	13.5	12.3	28.2	41.7	13.5	4.91
72	21-Oct-04	10:00	~ 23-Oct-04	10:00	14.7	11.0	18.4	12.3	7.36	6.13	9.82	9.82	11.0
73	18-Nov-04	10:30	~ 20-Nov-04	10:30	24.5	16.0	22.1	16.0	9.82	12.3	14.7	55.2	12.3
74	13-Dec-04	10:30	~ 15-Dec-04	10:30	34.4	30.7	58.9	54.0	60.1	85.9	82.2	42.9	36.8
75	24-Jan-05	10:30	~ 26-Jan-05	10:30	29.4	25.8	36.8	33.1	27.0	35.6	29.4	14.7	14.7

(6) Qingdao

No.	start		end		aeolian dust concentration ($\mu\text{g}/\text{m}^3$)									backup filter
	date	time	date	time	stage 0	stage 1	stage 2	stage 3	stage 4	stage 5	stage 6	stage 7		
1	01-May-01	8:30	~ 09-May-01	8:25	2.15	3.68	5.83	6.14	5.83	3.99	10.4	8.29	-	
2	09-May-01	8:50	~ 15-May-01	8:00	4.52	6.58	7.82	9.46	8.23	5.76	6.58	9.05	-	
3	06-Jun-01	9:45	~ 12-Jun-01	9:30	1.64	3.69	2.87	4.51	3.69	6.56	10.7	5.74	-	
4	24-Jun-01	9:00	~ 29-Jun-01	10:00	1.95	2.43	3.41	3.41	1.95	9.73	13.1	139.	-	
5	02-Jul-01	14:35	~ 05-Jul-01	14:35	6.54	5.73	7.36	8.18	8.18	13.9	18.8	12.3	15.5	
6	25-Jul-01	10:14	~ 29-Jul-01	10:14	1.84	3.68	5.52	10.4	6.75	7.36	11.0	9.20	9.20	
7	11-Aug-01	10:50	~ 17-Aug-01	10:11	2.46	0.41	0.00	2.46	1.64	3.29	2.46	4.11	31.6	
8	17-Aug-01	10:15	~ 21-Aug-01	16:35	4.25	3.64	5.46	4.85	0.61	3.03	6.67	4.85	6.07	
9	08-Sep-01	10:03	~ 13-Sep-01	10:10	6.86	4.90	10.3	10.3	5.88	5.39	10.3	7.84	7.35	
10	20-Sep-01	13:25	~ 25-Sep-01	13:25	7.36	7.85	19.1	6.87	6.38	11.3	29.9	5.89	8.34	
11	07-Oct-01	9:50	~ 11-Oct-01	10:10	2.45	0.00	4.28	7.34	5.50	13.4	43.4	7.34	5.50	
12	25-Oct-01	14:47	~ 29-Oct-01	15:40	12.8	11.5	8.51	9.12	7.90	12.2	24.9	6.08	5.47	
13	12-Nov-01	9:15	~ 16-Nov-01	9:15	4.29	0.00	13.5	5.52	3.07	8.59	57.1	11.0	24.5	
14	21-Nov-01	10:30	~ 26-Nov-01	15:25	3.30	42.4	23.1	19.8	15.1	13.7	31.1	9.90	10.4	
15	07-Dec-01	14:00	12-Dec-01	14:00	-	-	-	-	-	-	-	-	-	
16	24-Dec-01	9:40	27-Dec-01	9:45	40.9	18.8	31.0	44.9	5.72	20.4	0.00	95.6	30.2	
17	05-Jan-02	11:30	~ 09-Jan-02	11:30	11.7	17.2	22.1	16.0	16.6	11.0	19.6	126.	10.4	
18	17-Jan-02	10:30	~ 21-Jan-02	10:30	0.61	4.29	14.1	14.7	19.6	27.0	25.8	11.7	20.9	
19	03-Feb-02	12:25	~ 07-Feb-02	10:25	0.00	16.9	21.9	3.13	1.88	6.27	18.8	19.4	14.4	
20	18-Feb-02	10:00	~ 25-Feb-02	8:15	2.83	7.44	13.1	19.1	7.08	7.79	8.15	11.7	14.2	
21	08-Mar-02	11:30	~ 14-Mar-02	11:30	7.77	11.0	9.82	3.27	11.5	6.13	15.5	7.36	4.91	
22	20-Mar-02	10:45	~ 23-Mar-02	10:15	0.00	51.1	114.	106.	125.	34.6	18.1	15.6	8.24	
23	01-Apr-02	16:30	~ 04-Apr-02	15:30	23.2	13.3	30.7	36.5	33.2	26.5	15.8	24.1	19.9	
24	08-Apr-02	19:00	~ 13-Apr-02	15:38	25.2	16.7	10.1	38.4	10.1	18.2	8.58	2.02	6.56	
25	15-Apr-02	13:30	~ 19-Apr-02	16:30	11.9	4.16	1.19	6.54	19.0	0.00	8.33	8.92	10.7	
26	07-May-02	9:50	~ 12-May-02	9:50	4.91	94.2	0.00	4.42	1.47	2.94	1.96	5.89	22.1	
27	22-May-02	11:30	~ 26-May-02	11:30	18.4	14.1	17.8	16.6	11.7	9.20	14.1	12.3	12.3	
28	05-Jun-02	10:00	~ 09-Jun-02	8:10	3.13	3.75	6.25	4.38	5.00	6.25	13.8	5.63	0.00	
29	21-Jun-02	10:30	~ 29-Jun-02	9:05	3.40	4.33	5.25	9.89	1.85	1.85	2.16	2.78	1.85	
30	06-Jul-02	11:00	~ 10-Jul-02	10:45	13.5	10.5	16.6	12.9	8.00	4.31	7.38	6.15	3.08	
31	19-Jul-02	10:04	~ 24-Jul-02	8:04	7.49	3.99	6.49	5.99	7.99	12.5	15.0	5.99	1.50	
32	02-Aug-02	10:15	~ 06-Aug-02	18:00	5.68	6.81	9.08	8.51	6.24	3.97	7.38	2.84	1.70	

Appendix 2 (continue).

33	16-Aug-02	10:10	~ 21-Aug-02	11:53	11.6	9.68	17.9	14.5	10.2	12.1	19.4	10.2	6.29
34	05-Sep-02	11:05	~ 10-Sep-02	16:05	12.7	10.4	14.1	12.2	8.95	6.12	8.48	7.54	3.30
35	22-Sep-02	9:50	~ 26-Sep-02	16:30	14.9	13.2	18.9	15.5	9.75	11.5	14.9	13.2	8.03
36	08-Oct-02	10:00	~ 12-Oct-02	15:25	9.87	5.23	2.90	2.32	14.5	0.58	8.13	2.90	1.74
37	22-Oct-02	9:40	~ 26-Oct-02	10:50	3.03	13.9	15.2	9.70	10.9	12.7	10.9	7.27	0.61
38	08-Nov-02	9:00	~ 12-Nov-02	16:35	34.1	26.7	38.1	33.5	23.9	18.2	24.4	9.67	1.14
39	23-Nov-02	10:35	~ 27-Nov-02	8:40	18.8	9.39	16.3	13.1	13.8	16.9	26.9	8.76	3.76
40	08-Dec-02	15:10	~ 12-Dec-02	15:30	15.3	18.3	12.8	14.5	22.5	30.2	48.0	35.0	27.0
41	21-Dec-02	9:25	~ 25-Dec-02	14:20	6.65	6.24	7.29	10.8	6.42	11.8	14.0	11.6	7.41
42	05-Jan-03	10:40	~ 09-Jan-03	16:45	7.27	14.0	22.3	21.5	25.2	45.7	32.1	27.6	20.3
43	19-Jan-03	10:30	~ 23-Jan-03	10:30	7.98	3.86	10.8	11.3	15.0	25.9	36.2	23.3	14.0
44	05-Feb-03	16:45	~ 09-Feb-03	15:47	4.46	3.41	10.4	5.64	0.00	11.1	24.3	25.0	16.4
45	20-Feb-03	10:00	~ 24-Feb-03	15:00	3.21	10.5	18.0	2.45	12.4	10.7	14.3	17.0	8.40
46	17-Mar-03	8:35	~ 20-Mar-03	17:10	15.3	11.7	17.1	0.00	2.70	15.9	0.00	21.6	15.6
47	25-Mar-03	16:00	~ 28-Mar-03	17:21	10.4	0.00	23.8	15.9	14.9	20.5	8.59	20.0	11.5
48	13-Apr-03	9:15	~ 16-Apr-03	17:00	16.0	18.8	0.00	31.6	32.6	12.8	13.0	20.9	9.08
49	25-Apr-03	11:20	~ 28-Apr-03	12:26	0.00	7.98	9.67	5.00	12.5	0.16	12.9	7.98	2.42
50	15-May-03	15:00	~ 19-May-03	8:10	1.52	0.00	9.58	0.00	4.95	9.38	19.2	10.8	4.62
51	26-May-03	14:55	~ 29-May-03	17:06	2.78	3.18	2.14	3.33	6.83	3.97	8.65	3.81	2.30
52	11-Jul-03	9:15	~ 15-Jul-03	9:00	2.83	2.52	3.75	3.08	5.54	9.16	12.3	6.34	3.75

(7) Hefei

No.	start		end		aeolian dust concentration ($\mu\text{g}/\text{m}^3$)								
	date	time	date	time	stage 0	stage 1	stage 2	stage 3	stage 4	stage 5	stage 6	stage 7	backup filter
1	15-Mar-02	15:50	~ 20-Mar-02	16:00	18.0	17.0	27.1	26.9	19.2	13.9	18.5	7.20	4.56
2	21-Mar-02	14:21	~ 28-Mar-02	9:40	13.3	13.7	18.6	27.2	19.9	11.8	14.5	11.7	5.70
3	30-Mar-02	18:50	~ 05-Apr-02	16:18	31.4	16.9	45.3	45.7	21.7	15.7	24.5	14.0	36.9
4	12-Apr-02	8:45	~ 19-Apr-02	14:37	14.9	9.17	15.6	22.4	22.4	13.7	15.0	11.7	6.14

Appendix 3 Cumulative particle number for each hour observed by the OPC in Tsukuba during 19 March - 1 April 2004.

date	datanumber	Flow (ml/m)	>0.3 μm	>0.5 μm	>0.7 μm	>1 μm	>2 μm	>3 μm	>5 μm	>7 μm
19 March										
15	3600	102	446792	37639	15763	8755	3949	244	10	1
16	3600	102	476355	38760	15909	8984	4112	246	13	0
17	3600	103	621564	51507	19273	10045	4408	307	12	1
18	3600	103	511595	46050	19252	10240	4477	305	15	1
19	3600	103	427592	42180	18586	10354	4689	304	17	1
20	3600	102	414514	54301	22804	11279	4558	300	15	0
21	3600	102	339170	33576	15076	8533	4049	250	14	2
22	3600	102	505601	42128	16075	8830	4085	248	12	2
23	3600	102	483656	38264	15752	8949	4141	257	9	1
20 March										
0	3600	102	459888	41018	16414	9164	4256	237	11	2
1	3600	102	461555	42015	16873	9225	4212	263	16	0
2	3600	102	291916	28400	13619	8072	4008	240	7	0
3	3600	102	246444	25472	12583	7598	3786	245	6	0
4	3600	104	247398	25324	12607	7590	3838	234	9	1
5	3600	104	256106	25654	12659	7551	3761	279	13	0
6	3600	103	285597	28069	13659	8158	4015	282	13	0
7	3600	103	296381	28956	13744	7985	3882	265	8	1
8	3600	105	535196	49035	20040	10779	4893	299	25	0
9	3600	104	737906	58796	20810	10073	3956	202	7	0
10	3600	103	997347	64216	20813	9784	3600	128	3	0
11	3600	103	1292805	58073	16066	7151	2519	88	5	1
12	3600	102	1428723	55692	12559	4730	1336	32	1	0
13	3600	105	1355403	49285	9074	3066	856	19	0	0
14	3600	104	1223610	34495	6413	2384	728	19	1	0
15	3600	102	1559882	62583	10039	3191	860	19	0	0
16	3600	102	1860549	83810	16022	5152	1295	18	0	0
17	3600	101	1575875	55923	7066	2105	540	11	1	0
18	3600	102	1578866	72333	10681	3069	800	17	0	0
19	3600	102	1723747	77935	9195	2207	532	22	1	1
20	3600	102	1652346	72738	6711	1927	506	16	0	0
21	3600	102	1441035	54960	4353	1216	316	6	1	0
22	3600	105	1507286	61105	4585	1095	294	2	0	0
23	3588	105	1926030	65267	6571	1976	563	19	1	0
21 March										
0	3600	105	1979810	68310	10590	4165	1367	35	1	0
1	3600	105	1867986	95377	8045	2421	774	30	0	0
2	3600	106	2109083	155248	11125	2449	709	24	0	0
3	3600	105	2216031	120502	6453	1573	512	19	0	0
4	3600	105	1583332	49041	2913	895	294	12	0	0
5	3600	104	1761417	44565	2880	1005	332	11	0	0
6	3600	105	2052205	75610	3466	1008	345	15	0	0
7	3600	105	2261490	157246	12233	2660	768	26	2	4
8	3600	105	2330989	309170	35921	5619	787	25	1	1
9	3600	106	2603412	462939	69195	11463	1312	30	1	0
10	3600	107	2247509	335958	54875	10771	1864	68	1	0
11	3600	108	1273685	84427	14600	4668	1694	105	21	9
12	3600	108	708033	37641	10625	4682	1896	114	6	0
13	3600	107	402386	28960	8946	4160	1740	107	7	2
14	3600	107	392418	30124	9305	4128	1596	91	3	1
15	3600	107	422296	33248	9745	4244	1749	122	9	0
16	3600	107	449777	35393	10416	4593	1834	128	2	0
17	3600	106	667983	47856	13405	5559	2188	172	11	2
18	3600	105	825705	59963	16632	6903	2528	137	8	1
19	3600	105	847372	56274	16618	7163	2667	120	6	0
20	3600	105	894154	56609	17799	8238	3232	159	7	1
21	3600	104	1226095	65727	19312	8481	3222	124	8	2
22	3600	104	1487783	79708	21992	9079	3243	131	4	0
23	3587	103	1143087	57967	17235	8226	3364	156	6	0
22 March										
0	3600	104	1140512	57273	16029	7361	2965	121	2	1
1	3600	104	1174730	58054	15563	6897	2698	130	6	0
2	3600	104	1108262	55721	15165	6734	2609	131	0	0
3	3600	106	1536416	69959	17706	7610	2922	150	4	0
4	3600	109	1659788	73352	17672	7340	2811	134	11	1
5	3600	108	1339219	64088	15682	6411	2320	106	5	1
6	3600	108	1684986	111506	34570	12892	4069	189	12	1
7	3600	109	1289367	76330	20047	7420	2539	117	7	1
8	3600	108	1531536	78640	18766	7303	2633	192	10	0
9	3600	107	2434529	165594	44515	16665	4703	234	15	1
10	3600	107	3009187	171386	41754	15408	4677	261	17	3
11	3600	107	3495130	173337	37178	12900	3833	171	9	2
12	3600	108	3070018	167201	34553	12008	3699	149	5	0

Appendix 3 (continue).

date	datanumber	Flow(ml/m)	>0.3 μ m	>0.5 μ m	>0.7 μ m	>1 μ m	>2 μ m	>3 μ m	>5 μ m	>7 μ m
13	3600	108	2411529	121431	25221	9024	2809	95	4	0
14	3600	107	1692315	79761	16154	6038	2023	58	3	1
15	3600	107	1690506	76749	15473	5778	1920	57	0	0
16	3600	107	1924241	88284	17256	6209	1948	51	2	0
17	3600	106	1838325	80615	15237	5406	1675	55	2	1
18	3600	107	1963054	82656	15230	5491	1784	56	1	0
19	3600	106	1738907	61825	10800	3804	1242	35	1	0
20	3600	106	1874687	50361	7376	2460	719	11	0	0
21	3600	106	1809045	37681	4915	1527	403	11	0	0
22	3600	106	1728142	31002	3502	966	241	5	0	0
23	3587	106	1020924	11872	1552	441	114	5	0	0
23March										
0	3600	106	1725704	49124	4718	1445	368	9	1	0
1	3600	107	2215359	85299	6544	1634	404	9	0	0
2	3600	107	2259969	95168	6618	1579	435	10	1	0
3	3600	107	2612792	119740	9429	2512	721	24	1	0
4	3600	107	3195747	175120	13165	3743	967	21	3	0
5	3600	107	3015496	163645	11969	2802	761	16	0	0
6	3600	106	2880097	166644	11773	2531	695	29	1	0
7	3600	107	2907301	177730	13143	2659	629	23	2	2
8	3600	108	2855685	166377	14138	3201	894	28	1	0
9	3600	108	2600017	145256	13616	3293	912	34	0	0
10	3600	108	2036650	79850	9738	2923	868	26	0	0
11	3600	108	2360206	89533	10513	3049	887	33	3	1
12	3600	108	2723333	104022	13106	4285	1392	48	0	0
13	3600	110	2460751	107900	15954	5768	2106	63	4	1
14	3600	108	2595315	121023	18490	6996	2609	112	7	0
15	3600	106	2300462	105963	16893	6322	2333	73	1	0
16	3600	107	2254540	114282	17964	6645	2452	108	2	0
17	3600	107	2315370	125393	19531	7204	2688	110	6	1
18	3600	108	1765365	94833	19401	8508	3410	107	3	0
19	3600	107	1606504	88683	19480	8852	3635	96	1	0
20	3600	107	1457758	82609	19191	8849	3626	103	5	0
21	3600	107	1673277	98826	20184	8860	3590	112	7	0
22	3600	107	2105732	133571	22952	9447	3717	132	4	2
23	3557	107	1666263	106600	16658	6755	2648	70	2	0
24March										
0	3600	106	1742996	121273	18631	6950	2617	44	0	0
1	3600	109	1912120	135161	19335	6996	2522	57	1	0
2	3600	108	1979649	136302	20491	7612	2942	64	1	0
3	3600	108	1819618	112256	19030	7740	2987	77	1	0
4	3600	109	1535775	85580	15634	6395	2529	70	1	0
5	3600	109	1543012	84142	14985	5909	2307	53	2	0
6	3600	109	1479745	73049	14019	5731	2146	57	3	0
7	3600	108	1552194	78742	15361	6037	2174	63	0	0
8	3600	108	1717811	86452	15368	6013	2142	78	5	0
9	3600	108	1921820	99283	16454	6056	2143	82	5	0
10	3600	109	2237896	106820	15894	5627	2014	68	4	0
11	3600	109	1696884	73406	11822	4666	1791	63	2	0
12	3600	109	1167062	49353	8502	3435	1354	68	4	0
13	3600	108	1002777	41395	8515	3674	1506	60	4	0
14	3600	108	893495	38827	8990	3991	1580	70	2	0
15	3600	107	944214	42995	9971	4111	1466	57	3	0
16	3600	107	1017545	44877	10566	4399	1585	52	2	1
17	3600	107	974626	40495	9790	4192	1534	45	3	0
18	3600	106	1114411	43053	9539	4029	1474	32	0	0
19	3600	106	1452858	56624	10396	4068	1346	37	5	1
20	3600	107	1778193	70214	11884	4484	1552	34	1	0
21	3600	107	1820627	84320	11949	4381	1532	25	2	0
22	3600	107	1641574	85407	11428	4242	1628	34	1	0
23	3588	107	2225082	124459	16145	5413	1837	57	2	0
25March										
0	3600	107	2591618	159648	19099	6158	1958	65	2	1
1	3600	107	2518294	160433	17819	5488	1753	57	2	0
2	3600	107	2232784	145793	15652	4900	1616	46	1	1
3	3600	106	2629169	200606	21059	5826	1684	41	4	1
4	3600	106	2794313	214037	20801	5655	1737	51	2	0
5	3600	106	2743353	217135	20848	5422	1635	44	1	0
6	3600	107	2628948	210156	20300	5424	1744	60	0	0
7	3600	107	2427163	198517	20239	5764	1951	61	3	0
8	3600	107	2352126	192816	20608	6069	2189	63	1	0
9	3600	108	1891440	133196	19394	7128	2697	83	2	0
10	3600	108	1876481	116812	19485	7436	2809	98	3	0
11	3600	107	2285399	126830	21583	8548	3147	96	2	1

Appendix 3 (continue).

date	datanumber	Flow(ml/m)	>0.3 μm	>0.5 μm	>0.7 μm	>1 μm	>2 μm	>3 μm	>5 μm	>7 μm
12	3600	108	3393550	172563	21209	8065	3034	102	2	0
13	3600	108	2126908	67875	10562	4200	1658	65	1	0
14	3600	108	1890076	54498	10111	4330	1737	88	5	2
15	3600	108	2021770	71564	11311	4566	1832	89	6	1
16	3600	107	1919274	94274	14093	4816	1765	85	3	0
17	3600	107	1889070	104519	17014	6086	2117	70	4	1
18	3600	107	1791598	103594	16310	5984	2202	94	6	0
19	3600	107	1899357	159254	22416	6767	2250	82	5	0
20	3600	107	2121237	198578	26759	7501	2321	81	7	2
21	3600	107	2121426	244316	35965	10547	3527	155	15	0
22	3600	107	2195457	256978	35596	9532	2719	88	3	1
23	3587	107	2391712	307177	43734	11096	3012	74	4	0
26March										
0	3600	107	2486554	371608	58738	14731	3621	54	3	0
1	3600	107	2723975	429014	59545	12345	2653	40	1	0
2	3600	106	2802846	369799	41847	8485	2066	57	2	0
3	3600	106	2853126	336810	37594	8236	2101	45	2	0
4	3600	106	2869810	316199	37619	8318	2101	44	2	0
5	3600	105	2821228	297160	36000	7775	1890	51	1	0
6	3600	106	2522808	215322	26089	6102	1558	44	3	1
7	3600	106	2608887	215672	26522	6330	1592	72	4	0
8	3600	106	2703082	228387	28216	7153	1889	70	2	1
9	3600	106	2105353	148699	17140	4276	1193	50	1	0
10	3600	107	1747358	113324	12827	3127	858	36	0	0
11	3600	107	1784028	115174	13748	3545	1015	38	3	0
12	3600	107	1892528	125036	14738	3728	1070	52	3	0
13	3600	108	2135737	157761	18262	4311	1187	52	4	4
14	3600	108	2178187	162887	19570	4675	1253	56	1	0
15	3600	107	906351	43824	7182	2373	808	65	7	0
16	3600	107	622595	27180	5577	2142	810	64	6	1
17	3600	107	554373	24711	5379	2090	721	53	3	1
18	3600	106	724348	34219	7112	2554	876	58	3	0
19	3600	106	797896	37935	8075	2831	901	70	4	0
20	3600	105	794337	37376	8195	2996	1011	63	3	0
21	3600	105	795471	37161	8084	2984	1011	47	3	0
22	3600	108	847117	39490	8794	3289	1139	69	4	0
23	3587	107	930899	42835	9483	3453	1160	65	1	0
27March										
0	3600	106	1042329	46523	10008	3592	1150	61	2	0
1	3600	106	1119980	47693	9828	3442	1109	51	3	0
2	3600	106	1093309	46057	9292	3345	1097	57	2	0
3	3600	106	1034853	44042	9039	3110	971	51	3	1
4	3600	106	1014534	42133	8438	2918	882	29	3	0
5	3600	106	1064923	47626	9931	3413	955	44	3	0
6	3600	105	1048879	43943	8571	2969	910	47	2	0
7	3600	106	912769	39795	7739	2606	825	48	0	0
8	3600	107	879246	38340	8011	2952	1003	53	4	0
9	3600	107	762991	35252	7709	2850	973	48	3	0
10	3600	107	776855	36280	7975	2979	1051	61	1	0
11	3600	107	812864	38000	8190	3120	1083	51	4	0
12	3600	107	1033098	46744	9586	3623	1258	78	5	0
13	3600	107	903148	40991	8718	3394	1205	69	4	0
14	3600	106	619365	29638	6936	2812	986	65	5	1
15	3600	107	508558	26269	6322	2649	1014	100	9	2
16	3600	107	621570	30952	6818	2692	993	81	3	0
17	3600	107	904663	48760	11037	4122	1357	101	5	0
18	3600	106	1272508	70830	15977	5943	1932	130	13	1
19	3600	105	1540276	85196	18399	6674	2169	125	5	0
20	3600	105	1815874	100789	19725	7042	2317	123	9	1
21	3600	105	2082478	110164	23843	9080	2858	86	3	0
22	3600	104	2151150	107137	21558	8135	2564	61	3	1
23	3587	105	1925968	95474	17554	6715	2242	62	4	1
28March										
0	3600	104	1776585	91085	16714	6211	1950	53	2	0
1	3600	104	1153326	55495	11168	4374	1473	39	1	0
2	3600	104	946964	44283	9577	3758	1259	35	1	0
3	3600	104	1684422	87552	16300	6050	2043	67	4	1
4	3600	103	1531909	71549	13224	4876	1512	51	2	0
5	3600	104	1201016	50055	9772	3828	1232	34	0	0
6	3600	104	1053584	44267	8534	3362	1080	36	1	0
7	3600	105	1146132	47659	9820	3802	1281	41	5	1
8	3600	106	1214015	50960	10609	3985	1288	69	7	1
9	3600	106	916752	45733	10359	3848	1207	83	8	0
10	3600	106	1046226	55231	11327	4092	1321	70	9	1

Appendix 3 (continue).

date	datanumber	Flow(ml/m)	>0.3 μ m	>0.5 μ m	>0.7 μ m	>1 μ m	>2 μ m	>3 μ m	>5 μ m	>7 μ m
11	3600	107	998092	55024	11014	3835	1273	77	9	0
12	3600	107	829142	51108	10836	3787	1257	84	3	0
13	3600	107	698937	41336	9016	3273	1124	84	4	0
14	3600	107	742046	44037	9414	3445	1172	85	4	0
15	3600	106	852250	51467	11358	4016	1273	82	7	0
16	3600	107	729061	46491	10738	3980	1336	110	6	0
17	3600	106	561404	36064	9157	3595	1225	123	6	0
18	3600	105	591360	38711	10713	4291	1514	105	9	0
19	3600	105	746552	42781	10769	4514	1607	98	8	2
20	3600	105	767651	45846	11907	4805	1737	101	7	0
21	3600	105	1029916	65423	16087	6337	2232	135	8	1
22	3600	104	1193689	74110	18378	7363	2513	128	4	0
23	3588	104	1399185	80891	18337	7049	2385	113	4	0
29March										
0	3600	103	1891053	123431	26730	9378	2833	131	7	0
1	3600	103	2289900	158177	31578	10976	3290	130	5	1
2	3600	103	1988761	113028	19389	6940	2278	78	5	1
3	3600	104	1999858	102671	17844	6549	2182	96	5	1
4	3600	103	2113106	107969	18157	6607	2188	76	3	1
5	3600	104	2336649	127134	22498	7968	2738	143	15	2
6	3600	105	2609283	169201	32867	11957	4124	211	12	2
7	3600	106	2864163	205428	31253	10485	3532	169	11	0
8	3600	106	3290279	261777	37267	11509	3702	131	5	0
9	3600	106	3384222	262226	37160	11514	3748	164	14	3
10	3600	106	3175043	247375	37645	11581	3481	148	12	0
11	3600	106	1431409	89765	16825	6292	2317	137	9	1
12	3600	105	655231	30915	8039	3772	1622	124	11	1
13	3600	105	653897	31101	8459	4094	1831	154	10	0
14	3600	106	638590	30306	8468	4145	1932	168	9	1
15	3600	106	587597	30153	8793	4343	1984	163	5	0
16	3600	106	584060	31358	9451	4562	2015	131	5	0
17	3600	106	625414	34051	10487	5046	2145	103	9	0
18	3600	106	713458	45633	14001	6353	2529	124	4	0
19	3600	106	775611	42905	12676	5993	2606	122	11	3
20	3600	106	816157	45251	13594	6583	2798	116	2	0
21	3600	106	723673	38888	12110	6100	2646	109	5	0
22	3600	106	665617	37026	11986	6119	2709	126	3	0
23	3557	105	632226	35102	11287	5624	2428	116	5	1
30March										
0	3600	105	630051	35261	11176	5556	2458	105	1	0
1	3600	105	701141	38748	11669	5700	2547	117	7	0
2	3600	105	828193	44061	13288	6794	3116	194	5	0
3	3600	105	1048441	48337	13640	6825	3155	173	6	0
4	3600	105	1347484	62758	16425	8118	3620	186	1	0
5	3600	105	1758246	77541	17776	8463	3714	206	9	1
6	3600	106	1929425	91714	18683	8277	3585	187	10	0
7	3600	106	1519543	67196	15163	6918	3000	148	4	0
8	3600	106	1303162	65699	15481	7056	3055	134	6	0
9	3600	106	1256337	74352	17563	7962	3467	157	2	0
10	3600	106	1146272	66249	16290	7558	3357	124	7	1
11	3462	106	1026525	61037	16134	7735	3419	172	7	0
12	3600	106	1023258	59131	17655	8802	3900	139	8	1
13	3600	106	1061182	54849	18549	9753	4410	172	6	1
14	3600	106	1022458	54709	19851	10782	4911	173	7	1
15	3600	106	1157840	64779	23215	12598	5693	188	6	0
16	3600	106	1623263	97191	29559	15166	6691	174	3	0
17	3600	105	1999021	125016	31629	15149	6135	104	7	0
18	3600	105	2578969	170988	32497	13231	4427	73	1	0
19	3600	105	2594254	190665	29370	10424	2884	53	0	0
20	3600	105	1704928	107445	17242	5768	1406	25	1	0
21	3600	105	1208902	87205	16849	5736	1376	29	3	0
22	3600	105	583171	39663	12199	4722	1167	34	2	0
23	3600	105	636356	26375	5525	1973	500	30	2	0
31March										
0	3600	104	140065	6868	1502	641	226	18	4	1
1	3600	104	139070	7914	1643	703	275	32	1	0
2	3600	104	61930	3146	881	391	167	17	0	0
3	3600	104	474205	32386	4212	1213	394	21	1	0
4	3600	104	561831	34573	5806	1942	628	28	2	0
5	3600	104	984804	70801	9231	2643	824	32	2	0
6	3600	105	1402185	133985	17197	4297	1112	40	3	0
7	3600	106	1212839	110764	13462	3373	1009	43	3	0
8	3600	106	537311	36660	5577	1874	681	38	3	0
9	3600	109	386330	22058	3913	1511	596	54	5	1

Appendix 3 (continue).

date	datanumber	Flow(ml/m)	>0.3 μ m	>0.5 μ m	>0.7 μ m	>1 μ m	>2 μ m	>3 μ m	>5 μ m	>7 μ m
10	3600	109	303294	18859	4609	2198	1050	66	3	0
11	3600	109	424594	29342	8394	4277	1980	127	8	2
12	3600	108	472412	34328	10684	5595	2617	192	9	0
13	3600	108	450452	34264	11551	5975	2762	171	12	0
14	3600	108	399713	32018	11474	6282	3039	220	13	1
15	3600	107	599831	50670	15353	7673	3162	156	6	0
16	3600	106	732317	71932	27501	14773	6537	302	9	0
17	3600	106	656415	75120	32343	17909	8170	441	13	0
18	3600	106	562108	80525	39145	22511	10669	599	20	3
19	3600	106	638638	89003	43539	25306	11926	698	25	0
20	3600	106	593836	87008	44521	26068	12435	684	19	1
21	3600	106	550605	80332	42293	25035	12157	701	21	1
22	3600	106	535883	80429	42508	25147	11942	568	19	1
23	3588	106	453078	59938	30353	17831	8392	416	13	0
1 April										
0	3600	106	501046	65393	32879	19219	8955	421	12	1
1	3600	106	517977	63740	31879	18518	8779	440	9	2
2	3600	106	523118	48090	19108	10708	4982	360	13	2
3	3600	106	453686	40549	17585	10201	4881	344	12	1
4	3600	107	424149	37034	17250	10018	4883	370	17	4
5	3600	107	447437	37677	17310	9901	4789	327	11	1
6	3600	107	722827	57644	22752	12088	5405	307	14	2
7	3600	108	754264	62087	25510	13706	6208	287	10	1
8	3600	108	546622	52233	22863	12572	5622	301	10	0
9	3600	109	552209	50042	21860	12048	5376	322	16	4
10	3600	109	557151	44210	18102	9789	4302	277	17	1
11	3600	108	484000	34113	13766	7421	3496	296	19	3
12	3600	108	326904	24399	10081	5679	2704	223	2	0
13	3600	108	417642	34275	15032	8615	4082	286	16	0
14	3600	108	466761	40566	18342	10652	5019	355	14	0
15	3600	108	553511	47778	21120	12168	5724	354	15	1
16	3600	108	582610	58997	27022	15397	7126	409	13	0
17	3600	108	529543	52203	23879	13708	6475	357	10	0
18	3600	108	517769	49822	23435	13384	6407	368	14	0
19	3600	107	681925	54768	23380	13290	6195	348	8	1
20	3600	106	734551	57821	23561	12736	5717	270	6	1
21	3600	106	814629	62716	25212	13910	6406	329	7	1
22	3600	106	794811	62555	25960	14825	6908	355	7	1
23	3557	106	1150850	80313	28210	14825	6524	263	3	0