

# Supplementary Materials: Dust Criteria Derived from Long-Term Filter and Online Observations at Gosan in South Korea

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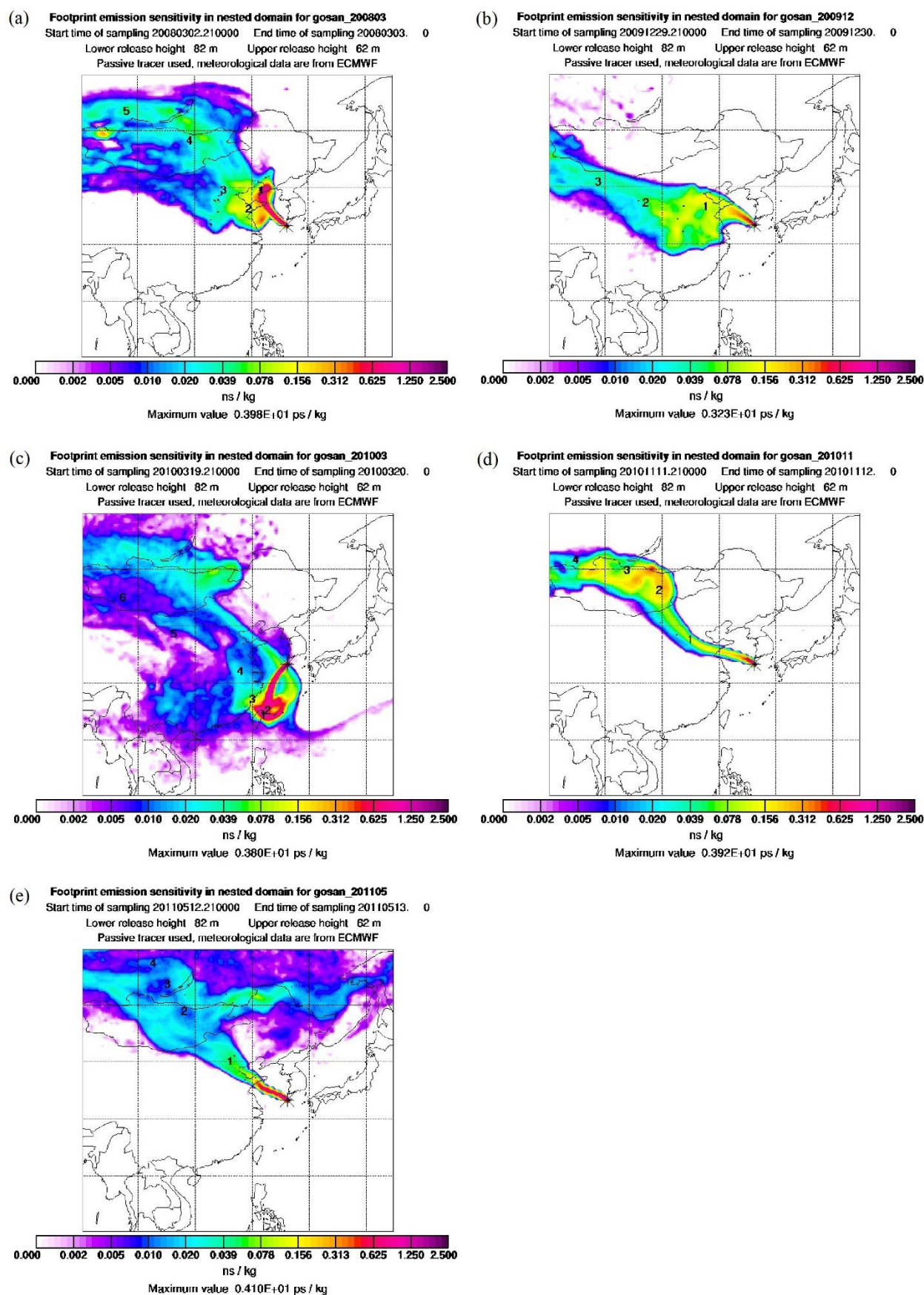
**Table S1.** The number of samples taken from 2007 to 2012.

Season	2007	2008	2009	2010	2011	2012
Spring (Mar.-May)	NA*	16	18	10	7	NA*
Summer (Jun.-Aug.)	1	3	8	9	4	NA*
Fall (Sep.-Nov.)	9	2	11	8	10	NA*
Winter (Dec.-Feb.)	2	8	3	10	10	3

\*NA is non-available.

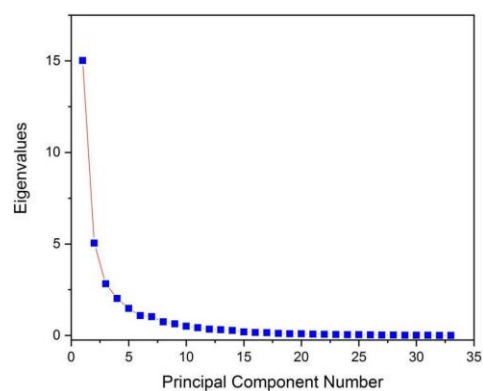
**Table S2.** The list of the event samples accompanied with the date from 2007 to 2012.

Date (yyyy.mm.dd)	Event
2010.11.12	Dust
2011.05.13	Dust
2008.03.03	Dust and rain
2009.12.30	Dust and snow
2010.03.20	Dust and haze
2008.01.09	Haze
2008.02.20	Haze
2009.03.16	Haze
2009.04.07	Haze
2009.04.08	Haze
2009.04.10	Haze
2009.11.26	Haze
2011.02.07	Haze
2011.10.06	Haze
2012.01.09	Haze



**Figure S1.** The five air mass trajectories that represent the influence of dust areas, and their dates correspond to Table S2. The Lagrangian particle dispersion model FLEXPART

(<http://zardoz.nilu.no/~andreas/STATIONS/GOSAN/index.html>, accessed on 25 October) is used to calculate the backward trajectory every 3 hours.



**Figure S2.** Eigenvalues according to the number of principal components.

**Table S3.** The matrix of correlations for each size of particles.

PM <sub>1</sub>	Cl <sup>−</sup>	NO <sub>3</sub> <sup>−</sup>	SO <sub>4</sub> <sup>2−</sup>	Na <sup>+</sup>	NH <sub>4</sub> <sup>+</sup>	K <sup>+</sup>	Mg <sup>2+</sup>	Ca <sup>2+</sup>	OC	EC	mass
Cl <sup>−</sup>	1.00	0.00	−0.04	0.91	−0.05	−0.02	0.34	−0.06	−0.03	−0.04	0.05
NO <sub>3</sub> <sup>−</sup>	0.00	1.00	0.74	0.00	0.48	0.68	0.00	0.08	0.45	0.56	0.80
SO <sub>4</sub> <sup>2−</sup>	−0.04	0.74	1.00	0.00	0.64	0.80	0.09	0.10	0.53	0.70	0.90
Na <sup>+</sup>	0.91	0.00	0.00	1.00	0.05	0.01	0.42	0.05	0.00	−0.02	0.11
NH <sub>4</sub> <sup>+</sup>	−0.05	0.48	0.64	0.05	1.00	0.37	−0.15	0.38	0.39	0.59	0.66
K <sup>+</sup>	−0.02	0.68	0.80	0.01	0.37	1.00	0.25	−0.01	0.61	0.71	0.76
Mg <sup>2+</sup>	0.34	0.00	0.09	0.42	−0.15	0.25	1.00	−0.13	0.24	0.16	0.06
Ca <sup>2+</sup>	−0.06	0.08	0.10	0.05	0.38	−0.01	−0.13	1.00	0.04	0.06	0.22
OC	−0.03	0.45	0.53	0.00	0.39	0.61	0.24	0.04	1.00	0.88	0.51
EC	−0.04	0.56	0.70	−0.02	0.59	0.71	0.16	0.06	0.88	1.00	0.65
mass	0.05	0.80	0.90	0.11	0.66	0.76	0.06	0.22	0.51	0.65	1.00
PM <sub>2.5</sub>	Cl <sup>−</sup>	NO <sub>3</sub> <sup>−</sup>	SO <sub>4</sub> <sup>2−</sup>	Na <sup>+</sup>	NH <sub>4</sub> <sup>+</sup>	K <sup>+</sup>	Mg <sup>2+</sup>	Ca <sup>2+</sup>	OC	EC	mass
Cl <sup>−</sup>	1.00	0.34	0.11	0.57	−0.02	0.00	0.47	0.30	0.19	−0.04	0.21
NO <sub>3</sub> <sup>−</sup>	0.34	1.00	0.60	0.12	0.46	0.56	0.34	0.23	0.68	0.64	0.61
SO <sub>4</sub> <sup>2−</sup>	0.11	0.60	1.00	0.06	0.53	0.66	0.34	0.14	0.60	0.66	0.66
Na <sup>+</sup>	0.57	0.12	0.06	1.00	0.12	−0.05	0.35	0.35	0.07	−0.11	0.18
NH <sub>4</sub> <sup>+</sup>	−0.02	0.46	0.53	0.12	1.00	0.38	−0.09	0.25	0.48	0.60	0.72
K <sup>+</sup>	0.00	0.56	0.66	−0.05	0.38	1.00	0.44	0.25	0.77	0.83	0.64
Mg <sup>2+</sup>	0.47	0.34	0.34	0.35	−0.09	0.44	1.00	0.45	0.43	0.22	0.32
Ca <sup>2+</sup>	0.30	0.23	0.14	0.35	0.25	0.25	0.45	1.00	0.43	0.27	0.52
OC	0.19	0.68	0.60	0.07	0.48	0.77	0.43	0.43	1.00	0.88	0.74
EC	−0.04	0.64	0.66	−0.11	0.60	0.83	0.22	0.27	0.88	1.00	0.76
mass	0.21	0.61	0.66	0.18	0.72	0.64	0.32	0.52	0.74	0.76	1.00
PM <sub>10</sub>	Cl <sup>−</sup>	NO <sub>3</sub> <sup>−</sup>	SO <sub>4</sub> <sup>2−</sup>	Na <sup>+</sup>	NH <sub>4</sub> <sup>+</sup>	K <sup>+</sup>	Mg <sup>2+</sup>	Ca <sup>2+</sup>	OC	EC	mass
Cl <sup>−</sup>	1.00	0.18	−0.07	0.74	−0.16	−0.03	0.58	0.32	0.16	−0.19	0.27
NO <sub>3</sub> <sup>−</sup>	0.18	1.00	0.68	0.17	0.68	0.66	0.37	0.53	0.68	0.67	0.70
SO <sub>4</sub> <sup>2−</sup>	−0.07	0.68	1.00	0.03	0.80	0.80	0.23	0.38	0.67	0.81	0.67
Na <sup>+</sup>	0.74	0.17	0.03	1.00	0.02	−0.03	0.51	0.38	0.13	−0.15	0.34
NH <sub>4</sub> <sup>+</sup>	−0.16	0.68	0.80	0.02	1.00	0.53	−0.11	0.30	0.46	0.69	0.59
K <sup>+</sup>	−0.03	0.66	0.80	−0.03	0.53	1.00	0.43	0.36	0.75	0.86	0.55
Mg <sup>2+</sup>	0.58	0.37	0.23	0.51	−0.11	0.43	1.00	0.49	0.45	0.13	0.41
Ca <sup>2+</sup>	0.32	0.53	0.38	0.38	0.30	0.36	0.49	1.00	0.51	0.27	0.81
OC	0.16	0.68	0.67	0.13	0.46	0.75	0.45	0.51	1.00	0.79	0.67
EC	−0.19	0.67	0.81	−0.15	0.69	0.86	0.13	0.27	0.79	1.00	0.49
mass	0.27	0.70	0.67	0.34	0.59	0.55	0.41	0.81	0.67	0.49	1.00