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"Field comparison of dry deposition samplers for collection of atmospheric mineral dust: results from single-particle characterization"

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1   Measurement

Table S 1: Minimum, Maximum and Median Mass Flux (**mg/(m2d)**) measured by **Vertical deposition samplers**. Mass Flux in each size interval is also shown.

FP=Flat plate, Sig=Sigma-2

Samp. Id.	Date	Temp (ºC)	Wind speed (m/s)	Mass flux (mg/(m2d))					
				Size interval (aerodynamic diameter)					
				1-2µm	2-4µm	4-8µm	8-16µm	16-32µm	32-64µm
FP	02.08.17	15.997	2.055	0.0125	0.0332	0.1591	0.6915	1.0487	0
FP	03.08.17	16.832	2.182	0.0178	0.085	0.4457	3.1786	3.5723	12.2381
FP	09.08.17	22.064	3.045	0.2318	2.5612	12.1382	22.3694	17.5472	0
FP	10.08.17	22.041	2.694	0.1268	1.7105	7.6181	14.3374	10.8418	7.2271
FP	20.08.17	23.049	2.321	0.0587	0.9965	7.7644	31.8469	39.2924	0
FP	21.08.17	22.127	1.991	0.0625	1.2487	9.9323	29.9751	22.0631	0
FP	22.08.17	21.126	3.011	0.0413	1.0977	8.4911	16.1487	9.563	0
FP	16.07.17	21.407	1.687	0.1512	1.6673	5.8333	10.3739	6.789	0
FP	18.07.17	19.863	3.289	0.0773	1.0835	4.3797	5.3431	4.4326	0
FP	19.07.17	17.691	4.275	0.0191	0.2874	1.4257	2.5807	0.7248	0

FP	20.07.17	15.915	4.620	0.0084	0.0437	0.3936	1.7336	2.0418	0
FP	24.07.17	20.758	3.883	0.1656	2.1236	8.9983	13.6345	2.7224	0
FP	25.07.17	20.784	2.055	0.1468	1.5641	6.7421	11.8483	0.7455	0
FP	26.07.17	20.989	2.550	0.0819	1.0551	5.0441	7.0303	1.8159	0
FP	27.07.17	21.563	2.092	0.1272	1.3325	6.6209	5.5919	0.8894	0
FP	28.07.17	22.325	2.318	0.0912	1.2328	4.7233	4.0095	1.9389	0
FP	29.07.17	21.971	4.438	0.0145	0.0798	0.5085	0.7329	1.9062	0
FP	30.07.17	19.823	4.874	0.08	0.2918	1.2003	1.9713	0	0
Sig	02.08.17	15.997	2.055	0.0133	0.0435	0.3232	1.4541	1.1561	0
Sig	03.08.17	16.832	2.182	0.0117	0.0637	0.2629	0.7752	0.7638	0
Sig	04.08.17	18.734	3.251	0.0537	0.2111	0.6742	0.9907	0.2664	0
Sig	09.08.17	22.064	3.045	0.2747	3.2314	12.3996	21.4241	7.4674	0
Sig	10.08.17	22.041	2.694	0.1171	1.312	4.7166	7.9581	1.4412	0
Sig	11.08.17	20.230	4.490	0.0506	0.3731	1.4438	3.2957	3.822	5.9832
Sig	12.08.17	18.666	4.551	0.0435	0.3212	1.0996	2.4052	2.1606	0
Sig	14.08.17	19.269	5.154	0.0929	0.6751	2.6105	5.3232	6.6811	0
Sig	15.08.17	19.918	1.855	0.0113	0.0581	0.2661	0.384	1.164	0
Sig	16.08.17	22.284	1.523	0.1003	0.973	3.507	5.4434	4.8978	0
Sig	17.08.17	21.384	2.978	0.1022	0.6704	2.382	4.9459	4.6931	0
Sig	18.08.17	20.574	3.080	0.0423	0.2089	0.7355	1.606	1.455	0
Sig	19.08.17	22.836	2.388	0.0337	0.2013	0.9165	2.0097	2.0509	0
Sig	20.08.17	23.049	2.321	0.2254	2.5137	12.8442	44.6417	42.0205	11.7559
Sig	21.08.17	22.127	1.991	0.3337	4.1199	20.8917	48.5994	36.6512	6.6514
Sig	22.08.17	21.126	3.011	0.2849	3.5102	16.3368	35.5797	17.1256	0
Sig	20.07.17	15.915	4.620	0.0102	0.0431	0.2539	1.8245	2.4863	0
Sig	21.07.17	14.153	3.830	0.0093	0.0405	0.1077	0.5439	0	0
Sig	26.07.17	20.989	2.550	0.1704	2.0074	8.3447	11.0216	3.496	0
Sig	27.07.17	21.563	2.092	0.1692	2.3802	10.0826	9.6501	4.2398	0
Sig	28.07.17	22.325	2.318	0.2126	2.3481	9.5403	10.2896	1.9448	0
Sig	29.07.17	21.971	4.438	0.1927	2.1052	8.1321	8.5173	1.0481	0
Sig	30.07.17	19.823	4.874	0.4671	1.2559	2.7535	4.3127	6.5318	0

Table S 2: Minimum, Maximum and Median Daily basis Number Flux (**1/(m² d**)) measured by **Vertical deposition samplers**. Mass Flux in each size interval is also shown.

FP=Flat plate, Sig=Sigma-2

Samp. Id.	Date	Temp (°C)	Wind speed (m/s)	Number Flux 1/(m²d)					
				Size interval (aerodynamic diameter)					
				1-2µm	2-4µm	4-8µm	8-16µm	16-32µm	32-64µm
FP	02.08.17	15.997	2.055	2.64E+06	9.95E+05	6.99E+05	2.69E+05	2.70E+05	0
FP	03.08.17	16.832	2.182	4.22E+06	2.39E+06	1.43E+06	1.14E+06	1.99E+05	8.50E+04
FP	09.08.17	22.064	3.045	4.12E+07	6.57E+07	4.39E+07	1.10E+07	8.10E+05	0
FP	10.08.17	22.041	2.694	2.17E+07	4.28E+07	2.70E+07	6.87E+06	6.30E+05	4.00E+04
FP	20.08.17	23.049	2.321	9.70E+06	2.33E+07	2.49E+07	1.20E+07	2.79E+06	0
FP	21.08.17	22.127	1.991	9.52E+06	2.87E+07	3.42E+07	1.35E+07	1.66E+06	0
FP	22.08.17	21.126	3.011	6.48E+06	2.43E+07	2.87E+07	7.87E+06	5.40E+05	0
FP	16.07.17	21.407	1.687	2.72E+07	4.26E+07	2.25E+07	5.69E+06	4.40E+05	0
FP	18.07.17	19.863	3.289	1.33E+07	2.74E+07	1.66E+07	3.02E+06	3.20E+05	0
FP	19.07.17	17.691	4.275	3.34E+06	6.59E+06	4.97E+06	1.32E+06	8.40E+04	0
FP	20.07.17	15.915	4.620	1.80E+06	1.34E+06	1.27E+06	6.96E+05	7.20E+04	0
FP	24.07.17	20.758	3.883	2.83E+07	5.16E+07	3.29E+07	7.71E+06	2.30E+05	0
FP	25.07.17	20.784	2.055	2.58E+07	4.07E+07	2.47E+07	6.18E+06	5.00E+04	0
FP	26.07.17	20.989	2.550	4.22E+06	1.59E+07	1.87E+07	5.13E+06	3.50E+05	0
FP	27.07.17	21.563	2.092	2.46E+07	3.40E+07	2.47E+07	3.59E+06	1.20E+05	0
FP	28.07.17	22.325	2.318	1.59E+07	3.19E+07	1.75E+07	2.43E+06	8.00E+04	0
FP	29.07.17	21.971	4.438	2.80E+06	2.08E+07	1.48E+06	4.25E+05	1.50E+05	0
FP	30.07.17	19.823	4.874	1.98E+07	7.50E+06	4.85E+06	9.70E+05	0	0
Sig	02.08.17	15.997	2.055	2.70E+06	1.32E+06	9.72E+05	5.13E+05	8.10E+04	0
Sig	03.08.17	16.832	2.182	2.55E+06	1.83E+06	9.93E+05	2.95E+05	5.40E+04	0
Sig	04.08.17	18.734	3.251	1.12E+07	6.50E+06	2.69E+06	4.80E+05	3.00E+04	0
Sig	09.08.17	22.064	3.045	4.64E+07	8.29E+07	4.79E+07	1.08E+07	5.80E+05	0
Sig	10.08.17	22.041	2.694	2.00E+07	3.34E+07	1.82E+07	4.23E+06	1.30E+05	0
Sig	11.08.17	20.230	4.490	9.72E+06	1.05E+07	5.75E+06	1.93E+06	3.30E+05	4.00E+04
Sig	12.08.17	18.666	4.551	8.52E+06	8.49E+06	3.71E+06	1.13E+06	1.33E+05	0
Sig	14.08.17	19.269	5.154	1.82E+07	1.77E+07	1.01E+07	2.65E+06	3.50E+05	0
Sig	15.08.17	19.918	1.855	2.07E+06	1.56E+06	9.83E+05	2.18E+05	5.50E+04	0
Sig	16.08.17	22.284	1.523	1.83E+07	2.45E+07	1.33E+07	2.77E+06	2.30E+05	0
Sig	17.08.17	21.384	2.978	2.10E+07	1.85E+07	8.83E+06	2.45E+06	3.60E+05	0
Sig	18.08.17	20.574	3.080	9.04E+06	5.60E+06	2.85E+06	7.56E+05	1.03E+05	0
Sig	19.08.17	22.836	2.388	6.42E+06	5.32E+06	3.42E+06	9.50E+05	1.52E+05	0
Sig	20.08.17	23.049	2.321	3.69E+07	6.64E+07	4.57E+07	1.98E+07	2.63E+06	6.00E+04
Sig	21.08.17	22.127	1.991	5.52E+07	1.04E+08	7.10E+07	2.22E+07	2.50E+06	1.00E+05

Sig	22.08.17	21.126	3.011	4.74E+07	8.96E+07	5.80E+07	1.73E+07	1.45E+06	0
Sig	20.07.17	15.915	4.620	2.11E+06	1.15E+06	7.38E+05	7.12E+05	1.27E+05	0
Sig	21.07.17	14.153	3.830	2.12E+06	1.25E+06	4.24E+05	2.74E+05	0	0
Sig	26.07.17	20.989	2.550	3.05E+07	5.15E+07	3.06E+07	6.54E+06	3.10E+05	0
Sig	27.07.17	21.563	2.092	2.95E+07	5.97E+07	3.74E+07	5.75E+06	4.30E+05	0
Sig	28.07.17	22.325	2.318	3.58E+07	6.28E+07	3.54E+07	5.81E+06	2.00E+05	0
Sig	29.07.17	21.971	4.438	3.20E+07	5.78E+07	3.10E+07	4.68E+06	1.00E+05	0
Sig	30.07.17	19.823	4.874	1.04E+08	4.09E+07	9.80E+06	2.10E+06	3.00E+05	0

Table S 3: Minimum, Maximum and Median Horizontal Mass Flux (**mg/m2d)** measured by **Horizontal deposition samplers**. Mass Flux in each size interval is also shown

MW=MWAC, BS=BSNE

Samp. Id.	Date	Temp. (°C)	Wind Speed (m/s)	Mass Flux (**mg/(m2d)**)					
				Size interval (aerodynamic diameter)					
				1-2µm	2-4µm	4-8µm	8-16µm	16-32µm	32-64µm
MW	02.08.17	15.997	2.055	0.053	0.3195	3.5756	18.9069	12.3191	0
MW	04.08.17	18.734	3.251	0.0308	0.1555	0.7479	0.9514	2.5171	0
MW	08.08.17	22.889	4.303	0.573	4.788	63.067	431.618	596.928	18.604
MW	09.08.17	22.064	3.045	0.3805	3.7223	53.2968	357.1174	276.0571	12.5649
MW	10.08.17	22.041	2.694	0.2763	3.1587	29.7283	207.9945	321.5826	53.2269
MW	12.08.17	18.666	4.551	1.1247	6.0944	49.9189	246.8832	180.6267	0
MW	14.08.17	19.269	5.154	3.1606	10.8308	87.7027	518.3101	513.3998	110.1782
MW	15.08.17	19.918	1.855	0.1272	0.742	5.9049	33.331	84.2202	0
MW	17.08.17	21.384	2.978	0.0619	0.5264	4.8274	36.7475	36.8723	26.7913
MW	18.08.17	20.574	3.080	0.1162	0.6434	4.26	21.1639	29.4541	47.5157
MW	19.08.17	22.836	2.388	0.059	0.4633	4.7649	21.8155	29.468	6.373
MW	21.08.17	22.127	1.991	0.2617	3.1625	17.5533	33.4467	24.5892	6.2844
MW	22.08.17	21.126	3.011	0.2238	2.7402	39.8506	288.9442	225.7404	24.2119
MW	20.07.17	15.915	4.620	0.1951	1.2363	12.9435	50.1497	120.0182	51.0725
MW	21.07.17	14.153	3.830	0.0234	0.1781	1.9931	7.0882	8.4802	2.4772
MW	22.07.17	15.603	2.559	0.0059	0.0165	0.0728	0.2085	0.3042	0
MW	23.07.17	17.732	4.427	0.0219	0.1316	1.4648	7.4614	6.4594	12.1317
MW	26.07.17	20.989	2.550	0.1499	1.7981	9.1141	11.8906	1.866	0
MW	27.07.17	21.563	2.092	0.1436	2.5401	16.6638	30.1571	9.0439	0
MW	28.07.17	22.325	2.318	0.1674	2.6065	12.0603	35.6525	24.0122	0

Samp. Id.	Date	Temp. (°C)	Wind Speed (m/s)						
MW	29.07.17	21.971	4.438	0.2055	2.4908	42.7172	163.4428	109.8901	0
MW	30.07.17	19.823	4.874	0.0576	0.4659	2.2444	5.989	7.0296	0
BS	03.08.17	16.832	2.182	0.0137	0.077	0.3143	0.7407	3.8354	0
BS	04.08.17	18.734	3.251	0.0193	0.1162	0.5597	1.6363	1.2249	0
BS	05.08.17	21.383	5.379	0.0506	0.6417	3.5234	8.293	9.3819	3.3068
BS	06.08.17	22.347	6.790	0.3858	5.0476	45.0073	159.0974	75.0699	26.4677
BS	07.08.17	22.706	4.842	0.6379	9.1193	51.2209	130.3214	80.8477	0
BS	08.08.17	22.889	4.303	0.7554	6.9688	36.7909	125.2447	88.1866	0
BS	09.08.17	22.064	3.045	0.3203	3.0439	13.5882	33.253	16.5779	21.672
BS	10.08.17	22.041	2.694	0.194	2.0181	8.6547	17.7228	10.3509	0
BS	12.08.17	18.666	4.551	0.037	0.3435	2.2437	8.2023	6.6773	4.2183
BS	14.08.17	19.269	5.154	0.1175	0.9683	7.6959	32.4113	37.7385	3.5343
BS	16.08.17	22.284	1.523	0.0036	0.0253	0.1168	0	0	0
BS	18.08.17	20.574	3.080	0.0403	0.2139	1.0044	3.4598	2.1027	0
BS	20.08.17	23.049	2.321	0.2178	2.2909	13.381	48.7953	48.1988	0
BS	21.08.17	23.049	1.991	0.3135	4.0807	21.3125	59.5899	52.2078	121.0427
BS	24.07.17	20.758	3.883	0.2912	3.0925	14.4286	33.4588	28.8779	0
BS	25.07.17	20.784	2.055	0.3448	2.9782	23.8669	15.4882	2.9016	0
BS	26.07.17	20.989	2.550	0.1655	1.8011	7.0431	15.266	3.2846	0
BS	27.07.17	21.563	2.092	0.2367	2.3747	9.1715	14.3749	2.402	0
BS	28.07.17	22.325	2.318	0.2228	2.2278	8.9356	9.8436	1.0245	0
BS	29.07.17	21.971	4.438	0.1944	2.3734	11.0921	20.7425	10.5312	4.1926
BS	30.07.17	19.823	4.874	0.0469	0.5442	2.8858	9.4036	5.3719	0

Table S 4: Minimum, Maximum and Median Horizontal Number Flux ($1/(m^2d)$) measured by

Horizontal deposition samplers. Number Flux in each size interval is also shown

MW=MWAC, BS=BSNE

Samp. Id.	Date	Temp. (°C)	Wind Speed (m/s)	Number Flux $1/(m^2d)$					
				Size interval (aerodynamic diameter)					
				1-2µm	2-4µm	4-8µm	8-16µm	16-32µm	32-64µm
MW	02.08.17	15.997	2.055	1.10E+07	9.09E+06	1.02E+07	7.47E+06	7.70E+05	0
MW	04.08.17	18.734	3.251	7.12E+06	4.26E+06	2.35E+06	4.20E+05	8.40E+04	0
MW	08.08.17	22.889	4.303	1.06E+08	1.29E+08	1.71E+08	1.86E+08	3.41E+07	2.00E+05
MW	09.08.17	22.064	3.045	7.20E+07	9.20E+07	1.40E+08	1.49E+08	1.66E+07	1.00E+05
MW	10.08.17	22.041	2.694	4.75E+07	8.06E+07	8.56E+07	8.75E+07	2.04E+07	4.80E+05
MW	12.08.17	18.666	4.551	2.21E+08	1.76E+08	1.47E+08	1.07E+08	1.42E+07	0
MW	14.08.17	19.269	5.154	6.09E+08	3.49E+08	2.46E+08	2.21E+08	3.26E+07	1.20E+06

MW	15.08.17	19.918	1.855	2.57E+07	2.04E+07	1.67E+07	1.33E+07	4.02E+06	0
MW	17.08.17	21.384	2.978	1.10E+07	1.33E+07	1.41E+07	1.58E+07	2.08E+06	9.00E+04
MW	18.08.17	20.574	3.080	2.22E+07	1.83E+07	1.27E+07	9.05E+06	1.76E+06	2.30E+05
MW	19.08.17	22.836	2.388	1.08E+07	1.12E+07	1.36E+07	1.00E+07	1.82E+06	8.00E+04
MW	21.08.17	22.127	1.991	4.54E+07	7.94E+07	6.27E+07	1.72E+07	1.32E+06	7.00E+04
MW	22.08.17	21.126	3.011	4.07E+07	6.93E+07	1.07E+08	1.24E+08	1.49E+07	1.00E+05
MW	20.07.17	15.915	4.620	3.67E+07	3.23E+07	3.71E+07	2.25E+07	5.07E+06	2.90E+05
MW	21.07.17	14.153	3.830	2.73E+07	2.67E+07	3.21E+07	1.68E+07	2.74E+06	1.50E+05
MW	22.07.17	15.603	2.559	1.33E+06	4.42E+05	1.63E+05	9.30E+04	2.30E+04	0
MW	23.07.17	17.732	4.427	4.31E+06	3.82E+06	3.87E+06	3.55E+06	4.33E+05	2.70E+04
MW	26.07.17	20.989	2.550	2.66E+07	4.53E+07	3.34E+07	6.39E+06	1.80E+05	0
MW	27.07.17	21.563	2.092	2.50E+07	6.16E+07	5.73E+07	1.62E+07	5.60E+05	0
MW	28.07.17	22.325	2.318	2.81E+07	6.41E+07	4.25E+07	1.51E+07	1.82E+06	0
MW	29.07.17	21.971	4.438	3.80E+07	5.98E+07	1.13E+08	8.17E+07	7.80E+06	0
MW	30.07.17	19.823	4.874	1.20E+07	1.23E+07	8.23E+06	2.59E+06	3.50E+05	0
BS	03.08.17	16.832	2.182	2.67E+06	2.17E+06	1.09E+06	3.29E+05	9.90E+04	0
BS	04.08.17	18.734	3.251	4.43E+06	3.20E+06	1.92E+06	6.94E+05	9.90E+04	0
BS	05.08.17	21.383	5.379	9.16E+06	1.64E+07	1.20E+07	4.15E+06	4.90E+05	4.00E+04
BS	06.08.17	22.347	6.790	6.61E+06	1.27E+07	1.39E+07	7.15E+06	6.30E+05	3.00E+04
BS	07.08.17	22.706	4.842	1.06E+08	2.32E+08	1.72E+08	5.82E+07	6.40E+06	0
BS	08.08.17	22.889	4.303	1.44E+08	1.79E+08	1.29E+08	5.15E+07	7.70E+06	0
BS	09.08.17	22.064	3.045	5.65E+07	7.88E+07	5.07E+07	1.62E+07	1.01E+06	2.00E+05
BS	10.08.17	22.041	2.694	3.35E+07	5.33E+07	3.11E+07	9.35E+06	8.30E+05	0
BS	12.08.17	18.666	4.551	7.11E+06	8.52E+06	6.52E+06	3.50E+06	5.08E+05	2.80E+04
BS	14.08.17	19.269	5.154	2.45E+07	2.59E+07	2.36E+07	1.39E+07	2.10E+06	4.00E+04
BS	16.08.17	22.284	1.523	6.98E+05	7.62E+05	4.44E+05	0	0	0
BS	18.08.17	20.574	3.080	8.63E+06	6.30E+06	3.38E+06	1.63E+06	2.08E+05	0
BS	20.08.17	23.049	2.321	3.65E+07	6.08E+07	4.45E+07	2.19E+07	3.23E+06	0
BS	21.08.17	23.049	1.991	5.14E+07	1.01E+08	7.45E+07	2.65E+07	3.30E+06	2.00E+05
BS	24.07.17	20.758	3.883	5.28E+07	7.98E+07	4.97E+07	1.60E+07	1.96E+06	0
BS	25.07.17	20.784	2.055	6.03E+07	7.79E+07	3.61E+07	8.75E+06	2.40E+05	0
BS	26.07.17	20.989	2.550	2.95E+07	4.74E+07	2.66E+07	7.58E+06	2.90E+05	0
BS	27.07.17	21.563	2.092	4.11E+07	6.26E+07	3.46E+07	7.21E+06	2.00E+05	0
BS	28.07.17	22.325	2.318	3.95E+07	5.91E+07	3.33E+07	5.38E+06	1.00E+05	0
BS	29.07.17	21.971	4.438	3.27E+07	6.05E+07	3.87E+07	1.03E+07	7.50E+05	5.00E+04
BS	30.07.17	19.823	4.874	8.72E+06	1.35E+07	1.00E+07	4.23E+06	4.70E+05	0

Table S 5: Minimum, Maximum and Median Upward and Downward Mass Flux (**mg/m2d**) measured by Flat plate sampler (25mm) specified in size intervals (µm). Mass Flux in each size interval is also shown.

FP_U=Upward flux, FP_D=Downward flux

Samp. Id.	Date	Temp. (°C)	Wind speed (m/s)	Mass flux (mg/(m2d))					
				Size interval (aerodynamic diameter)					
				1-2µm	2-4µm	4-8µm	8-16µm	16-32µm	32-64µm
FP_U	20.07.17	15.915	4.620	0.006	0.0126	0.0071	0.1607	0	0
FP_U	21.07.17	14.153	3.830	0.0085	0.0128	0.1135	0.2452	0	0
FP_U	24.07.17	20.758	3.883	0.0129	0.0456	0.2431	0.5339	0	0
FP_U	25.07.17	20.784	2.055	0.0251	0.0397	0.2362	0	0	0
FP_U	26.07.17	20.989	2.550	0.0104	0.0803	0.1911	0.0924	0	0
FP_U	27.07.17	21.563	2.092	0.0065	0.0223	0.0759	0.2792	0.6606	0
FP_U	28.07.17	22.325	2.318	0.0225	0.0375	0.1186	0.0279	0	0
FP_U	29.07.17	21.971	4.438	0.021	0.0444	0.1147	0.2817	0.2653	0
FP_D	20.07.17	15.915	4.620	0.0153	0.0578	0.2786	0.8438	0.2835	0
FP_D	21.07.17	14.153	3.830	0.0357	0.1865	1.0712	3.7204	2.787	0
FP_D	24.07.17	20.758	3.883	0.227	2.7686	7.7674	5.2542	7.7463	0
FP_D	25.07.17	20.784	2.055	0.2505	2.414	8.6004	9.5165	4.7043	0
FP_D	26.07.17	20.989	2.550	0.1151	1.4906	5.555	6.5666	3.226	0
FP_D	27.07.17	21.563	2.092	0.1608	2.1048	8.2862	10.0201	2.0881	0
FP_D	28.07.17	22.325	2.318	0.1585	1.8237	7.0338	7.517	1.2685	0
FP_D	29.07.17	21.971	4.438	0.154	2.0606	9.0657	8.783	2.9589	0

Table S 6: Minimum, Maximum and Median Upward and Downward Number Flux (**#/m2d**) measured by Flat plate sampler (25mm) specified in size intervals (µm). Number flux in each size interval is also shown

FP_U=Upward flux, FP_D=Downward flux.

Samp. Id.	Date	Temp (ºC)	Wind speed (m/s)	Number flux, 1/(m²d)					
				Size interval (aerodynamic diameter)					
				1-2µm	2-4µm	4-8µm	8-16µm	16-32µm	32-64µm
FP_U	20.07.17	15.915	4.620	1.70E+06	4.60E+05	3.50E+04	7.10E+04	0	0
FP_U	21.07.17	14.153	3.830	1.86E+06	5.32E+05	3.63E+05	1.21E+05	0	0
FP_U	24.07.17	20.758	3.883	2.68E+06	1.28E+06	8.35E+05	3.44E+05	0	0
FP_U	25.07.17	20.784	2.055	4.99E+06	1.28E+06	9.14E+05	0	0	0
FP_U	26.07.17	20.989	2.550	2.33E+06	2.15E+06	7.46E+05	6.80E+04	0	0
FP_U	27.07.17	21.563	2.092	1.40E+06	6.74E+05	2.89E+05	9.60E+04	2.40E+04	0
FP_U	28.07.17	22.325	2.318	4.84E+06	1.20E+06	5.19E+05	2.70E+04	0	0
FP_U	29.07.17	21.971	4.438	4.84E+06	1.20E+06	5.19E+05	2.70E+04	0	0
FP_D	20.07.17	15.915	4.620	3.81E+06	1.82E+06	9.61E+05	3.64E+05	3.30E+04	0
FP_D	21.07.17	14.153	3.830	7.68E+06	6.33E+06	3.75E+06	1.84E+06	1.94E+05	0
FP_D	24.07.17	20.758	3.883	3.90E+07	7.12E+07	3.37E+07	3.25E+06	6.20E+05	0
FP_D	25.07.17	20.784	2.055	4.43E+07	6.54E+07	3.30E+07	5.41E+06	2.70E+05	0
FP_D	26.07.17	20.989	2.550	2.03E+07	3.77E+07	2.11E+07	3.41E+06	2.80E+05	0
FP_D	27.07.17	21.563	2.092	2.61E+07	5.22E+07	3.10E+07	5.26E+06	2.10E+05	0
FP_D	28.07.17	22.325	2.318	2.75E+07	4.70E+07	2.61E+07	4.41E+06	1.30E+05	0
FP_D	29.07.17	21.971	4.438	2.59E+07	5.27E+07	3.50E+07	4.81E+06	2.40E+05	0

Table S 7: Summary of regression analysis for correlation between calculated dust concentration and OPC measurement

Sampler	Calculated concentration vs OPC measured concentration		
	r²	p-value	slope
Flat plate	0.449	0.0241	0.4084
MWAC	0.243	0.214	0.1654
BSNE	0.968	4.70E-08	0.8046
Sigma-2	0.794	0.00127	0.6851
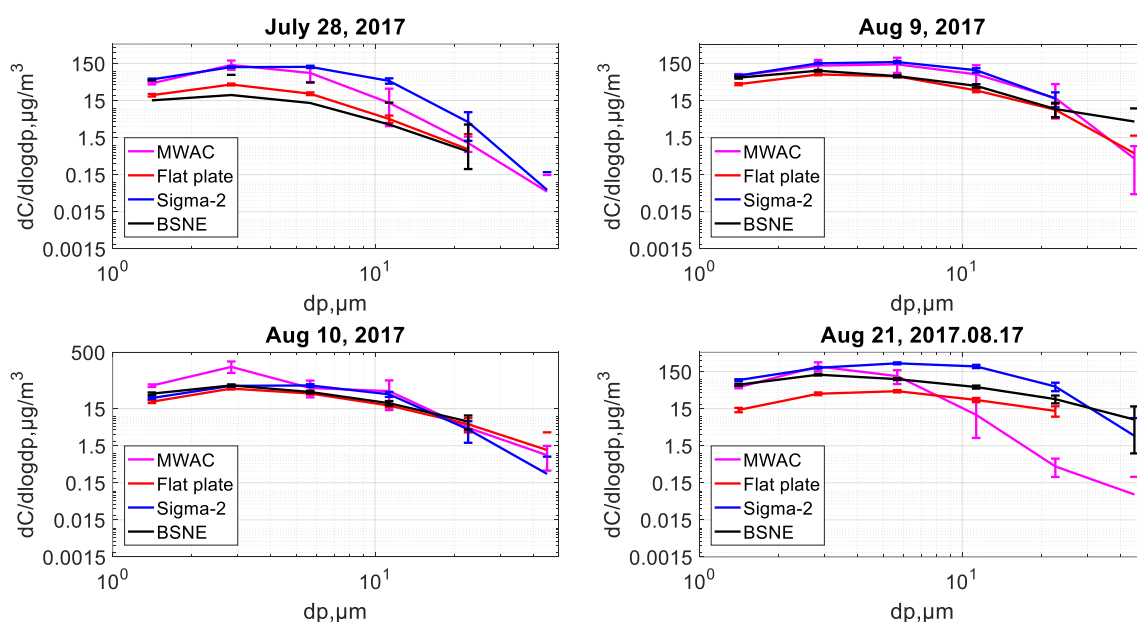
Figure S 1: Comparison of size resolved mass concentration measured by different samplers using different deposition velocity models. MWAC: Impaction curve & Piskunov deposition velocity model; Flat plate: Piskunov deposition velocity model; BSNE: Piskunov deposition velocity model; Sigma-2: Stokes' velocity.
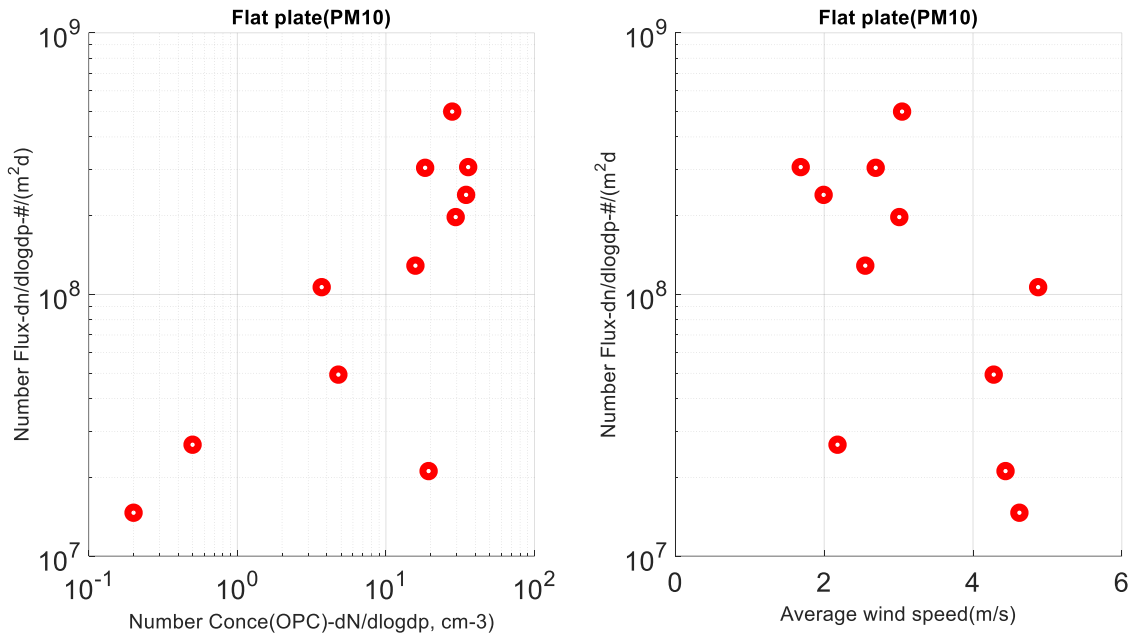
Figure S 2: Correlation between flux, dust concentration, and meteorological factor (wind speed).
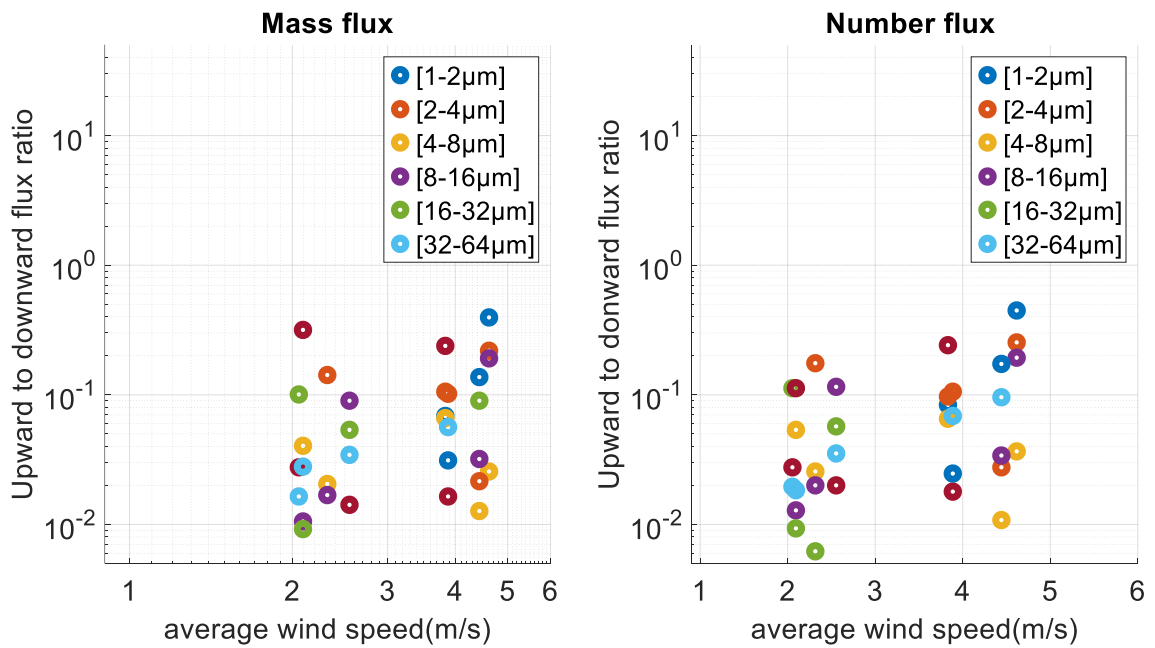
Figure S 3: Upward to downward flux ratio (number) vs wind speed. The flux is measured using flat plate sampler (with 25mm stub).

2 Computational fluid dynamics (CFD) simulation

2.1 Detail of the sampler construction for CFD geometries

2.1.1 Flat plate sampler

The bottom part of the sampler is a cylinder with a diameter of 28.9 mm and a height of 29 mm followed by another cylinder with a diameter of 40 mm and a height of 14 mm. The first plate has a diameter of 127 mm and a thickness of 1 mm. In the middle of the area, the deposition area is defined as a circular surface with a diameter of 12 mm or 25 mm respectively. The upper plate has the same thickness but a diameter of 203.2 mm. Three columns hold the upper plate. The center of these columns is arranged on a diameter of 116 mm. The diameter of the columns is 5 mm with a height of 16 mm.
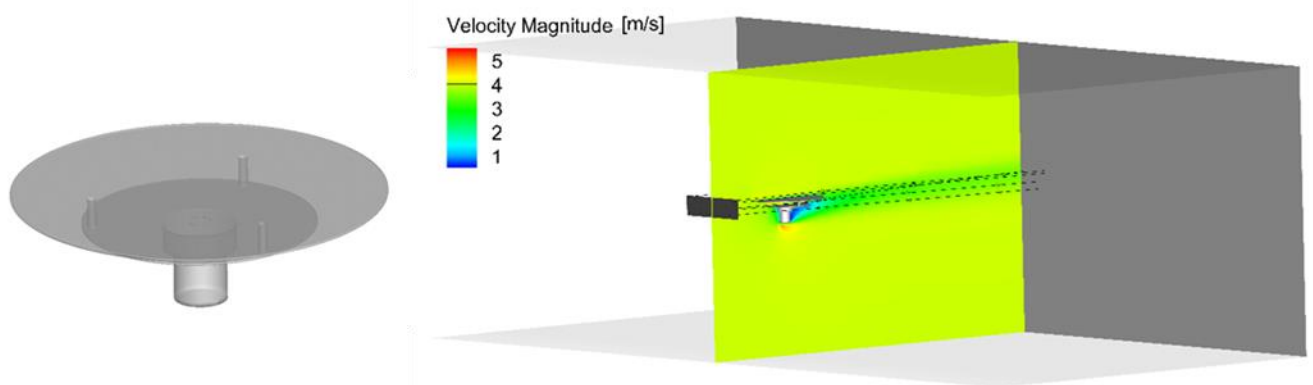
Figure S 4: Geometry of Flat plate sampler (left), CFD modeling domain and velocity magnitude, inlet velocity: 4m/s (right); in addition, the injection area is shown in black (width 0.2 m, height 0.05 m) along with exemplary particle trajectories.

2.1.2 Sigma-2 sampler

At the bottom, it consists of a mounting pole with an inner diameter of 36 mm and an outer diameter of 50 mm with a height of 32 mm. Then follows the bottom of the sampler with a diameter of 108 mm and a height of 14 mm. The wall of the geometry has an inner diameter of 104 mm and is 260 mm high. From a height of 214 mm the cover of the sampler starts. It has an inner diameter of 154 mm and an outer diameter of 158 mm. In it, there are four openings, which start at a height of 226 mm and have a width of 40 mm and a height of 75 mm. The same openings exist in the inner radius as well however turned by 90 degrees. The collector inside the geometry has a diameter of 12 mm, a height of 13 mm and is positioned centrally at the bottom.
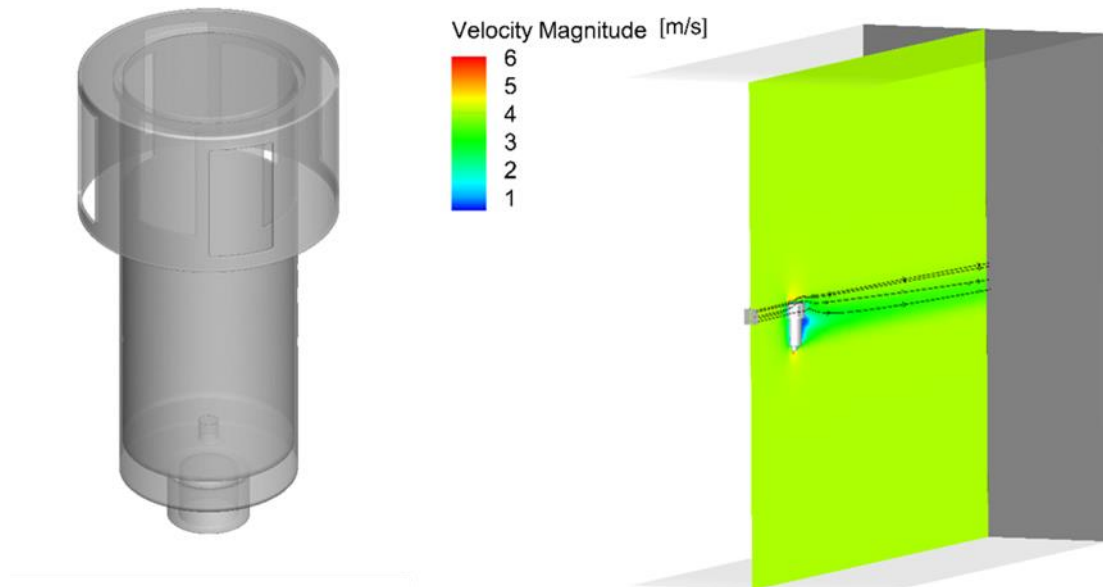
Figure S 5: Geometry of Sigma-2 sampler (left), CFD modeling domain and velocity magnitude; inlet velocity: 4m/s (right); in addition, the injection area is shown in black (width 0.2 m, height 0.1 m) along with exemplary particle trajectories.

2.1.3 MWAC sampler

The bottom diameter of the sampler is 48 mm with a thickness of 1.25 mm. Afterwards the inner diameter is 45.4 mm up to a height of 60 mm. The diameter then narrows semi circularly to 24 mm. The lid of the sampler has a diameter of 40 mm and a height of 17 mm.

The pipes have an inner diameter of 7.5 mm and a thickness of 1.25 mm. The pipe looking into the direction of the velocity inlet is longer and ends 23 mm above the bottom of the sampler. The outgoing pipe starts 38 mm above the bottom. The collector inside the geometry has a diameter of 12 mm, a height of 13 mm and is positioned centrally at the bottom.
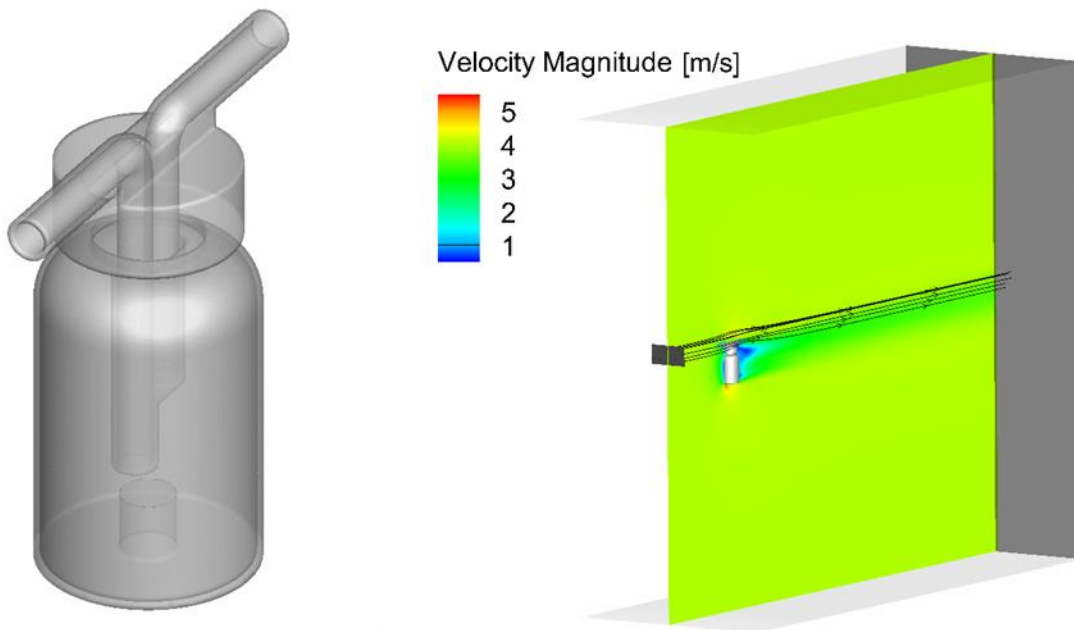
Figure S 6: Geometry of MWAC sampler (left), CFD modeling domain and velocity magnitude of MWAC sampler, inlet velocity: 4m/s (right); in addition, the injection area is shown in black (width 0.1 m, height 0.05 m) along with exemplary particle trajectories.
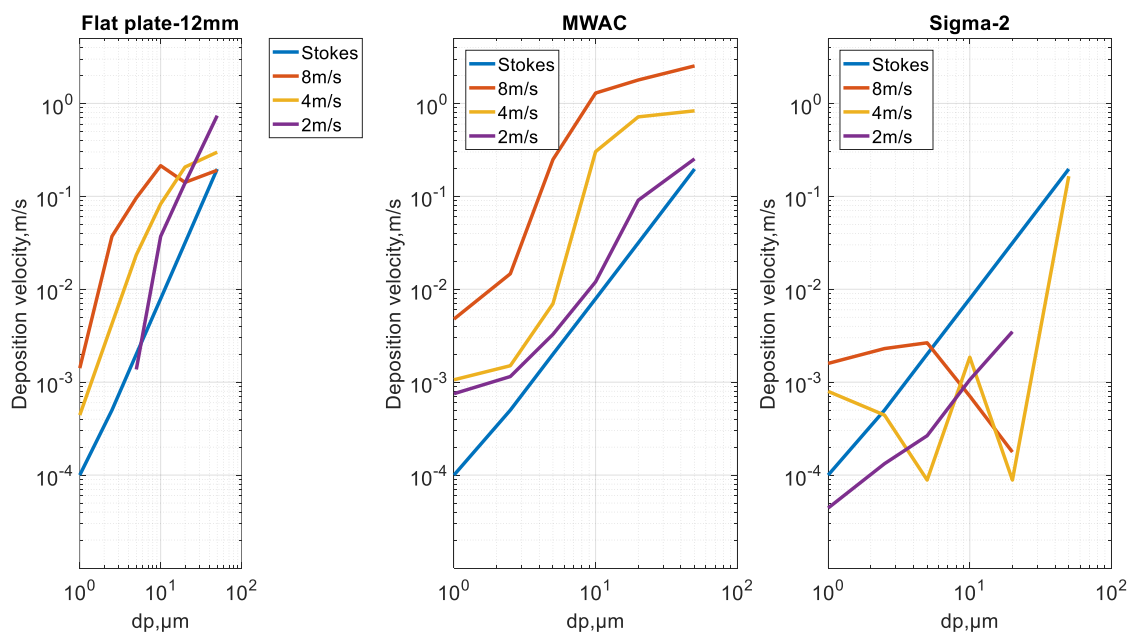
Figure S 7: Comparing the CFD-derived particle deposition velocities at at different wind speed values for different samplers.