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Supplement of

Seasonality of ultrafine and sub-micron aerosols and the inferences on particle formation processes

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Table S1. Mass concentration of the major components of UFPs and PM$_1$ in each season

| Unit: µg/m$^3$ | Total Mass | OC   | EC   | SO$_4^{2-}$ | NO$_3^-$ | NO$_2^-$ | NH$_4^+$ | Others |
|----------------|------------|------|------|-------------|----------|----------|----------|--------|
| UFPs Autumn    | 0.74       | 0.22 | 0.06 | 0.048       | 0.014    | 0.054    | 0.013    | 0.34   |
| Winter         | 0.73       | 0.20 | 0.02 | 0.025       | 0.004    | 0.012    | 0.003    | 0.47   |
| Spring         | 0.96       | 0.32 | 0.06 | 0.034       | 0.002    | 0.009    | 0.009    | 0.53   |
| Summer         | 1.62       | 0.47 | 0.06 | 0.064       | 0.006    | 0.032    | 0.019    | 0.97   |
| Average        | 1.01       | 0.30 | 0.05 | 0.043       | 0.007    | 0.027    | 0.011    | 0.57   |

| PM$_1$ Autumn  | 13.9       | 1.29 | 0.70 | 6.521       | 0.154    | 0.093    | 1.846    | 3.34   |
| Winter         | 14.7       | 1.82 | 0.74 | 5.652       | 0.549    | 0.078    | 1.883    | 4.01   |
| Spring         | 18.5       | 1.88 | 0.94 | 6.859       | 1.044    | 0.171    | 2.377    | 5.19   |
| Summer         | 11.6       | 1.65 | 0.64 | 3.913       | 0.044    | 0.091    | 1.385    | 3.84   |
| Average        | 14.7       | 1.66 | 0.76 | 5.736       | 0.448    | 0.108    | 1.873    | 4.10   |
Table S2. Time periods defined as under the influence of continental outflows

| Start date/time (LT) | End date/time (LT) | Duration (hr) |
|----------------------|--------------------|---------------|
| 24 Oct 2012 00:00    | 27 Oct 2012 02:00  | 74            |
| 27 Oct 2012 21:00    | 31 Oct 2012 02:00  | 53            |
| 31 Oct 2012 16:00    | 3 Nov 2012 20:00   | 76            |
| 4 Nov 2012 11:00     | 8 Nov 2012 10:00   | 95            |
| 11 Nov 2012 12:00    | 12 Nov 2012 15:00  | 27            |
| 13 Nov 2012 13:00    | 16 Nov 2012 00:00  | 59            |
| 4 Jan 2013 00:00     | 5 Jan 2013 02:00   | 26            |
| 5 Jan 2013 10:00     | 8 Jan 2013 04:00   | 66            |
| 8 Jan 2013 09:00     | 9 Jan 2013 00:00   | 15            |
| 9 Jan 2013 12:00     | 11 Jan 2013 20:00  | 56            |
| 14 Jan 2013 13:00    | 15 Jan 2013 17:00  | 28            |
| 16 Jan 2013 14:00    | 19 Jan 2013 23:00  | 81            |
| 22 Jan 2013 12:00    | 24 Jan 2013 10:00  | 46            |
| 20 Mar 2013 19:00    | 21 Mar 2013 23:00  | 28            |
| 24 Mar 2013 22:00    | 26 Mar 2013 04:00  | 30            |
| 27 Mar 2013 11:00    | 28 Mar 2013 21:00  | 34            |
| 29 Mar 2013 08:00    | 30 Mar 2013 22:00  | 38            |
| 2 Apr 2013 11:00     | 3 Apr 2013 21:00   | 34            |
| 7 Apr 2013 05:00     | 8 Apr 2013 06:00   | 25            |
| 9 Apr 2013 20:00     | 12 Apr 2013 00:00  | 52            |
Table S3. Time periods defined as the new particle formation events and the particle growth and formation rates

| Date       | Time period (LT) | Growth rate (nm h$^{-1}$) | Formation rate (cm$^{-3}$ s$^{-1}$) |
|------------|------------------|---------------------------|-------------------------------------|
| 26 Mar 2013| 06:00-10:00      | 3.4                       | 1.91                                |
| 4 Apr 2013 | 07:00 – 10:00    | 3.7                       | 1.13                                |
| 5 Apr 2013 | 08:00 – 12:00    | 5.5                       | 1.10                                |
| 4 Aug 2013 | 09:00 – 12:00    | 3.9                       | 1.84                                |
| 5 Aug 2013 | 09:00 – 13:00    | 4.9                       | 2.44                                |
| 7 Aug 2013 | 06:00 – 12:00    | 3.5                       | 0.84                                |
| 8 Aug 2013 | 09:00 – 12:00    | 5.0                       | 2.76                                |
| 11 Aug 2013| 06:00 – 09:00    | 4.8                       | 0.58                                |
| Average    |                  | 4.3 (±0.8)                | 1.6 (±0.8)                          |
Figure S1. Time series of measured parameters during a) autumn, b) winter and c) spring, the periods under the influence of continental outflow were highlighted. From the bottom to top: PSD, the N_{4.25}, N_{25-100}, N_{100-736}, PM_{10}, ozone (O_3) and wind direction/speed.