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*Supplement of*

# Seasonal variations of ultra-fine and submicron aerosols in Taipei, Taiwan: implications for particle formation processes in a subtropical urban area

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**Table S1.** Fitting results of the particle number size distributions of each season, and during long-range (LRT) and non long-range transport (non-LRT).

| | Mode 1 | | Mode 2 | | Mode 3 | |
|---|---|---|---|---|---|---|
| | ***n*** **($10^3$ #/$cm^3$)** | ***GMD*** | ***n*** **($10^3$ #/$cm^3$)** | ***GMD*** | ***n*** **($10^3$ #/$cm^3$)** | ***GMD*** |
| **Autumn** | 8.1 | 10.4 | 4.6 | 38.4 | 1.3 | 159 |
| **Winter** | 9.9 | 10.4 | 5.6 | 26.5 | 1.5 | 100 |
| **Spring** | 8.1 | 10.4 | 7.1 | 28.6 | 3.1 | 107 |
| **Summer** | 6.2 | 12.8 | 3.8 | 30.4 | 5.0 | 91.8 |
| **LRT** | 9.2 | 10.4 | 4.0 | 37.2 | 1.3 | 158 |
| **Non-LRT** | 8.6 | 11.4 | 9.3 | 30.4 | 2.6 | 114 |

**Table S2.** 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*** | 1.64 | 0.47 | 0.06 | 0.064 | 0.006 | 0.032 | 0.019 | 0.98 |
| | ***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 S3**. 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 |

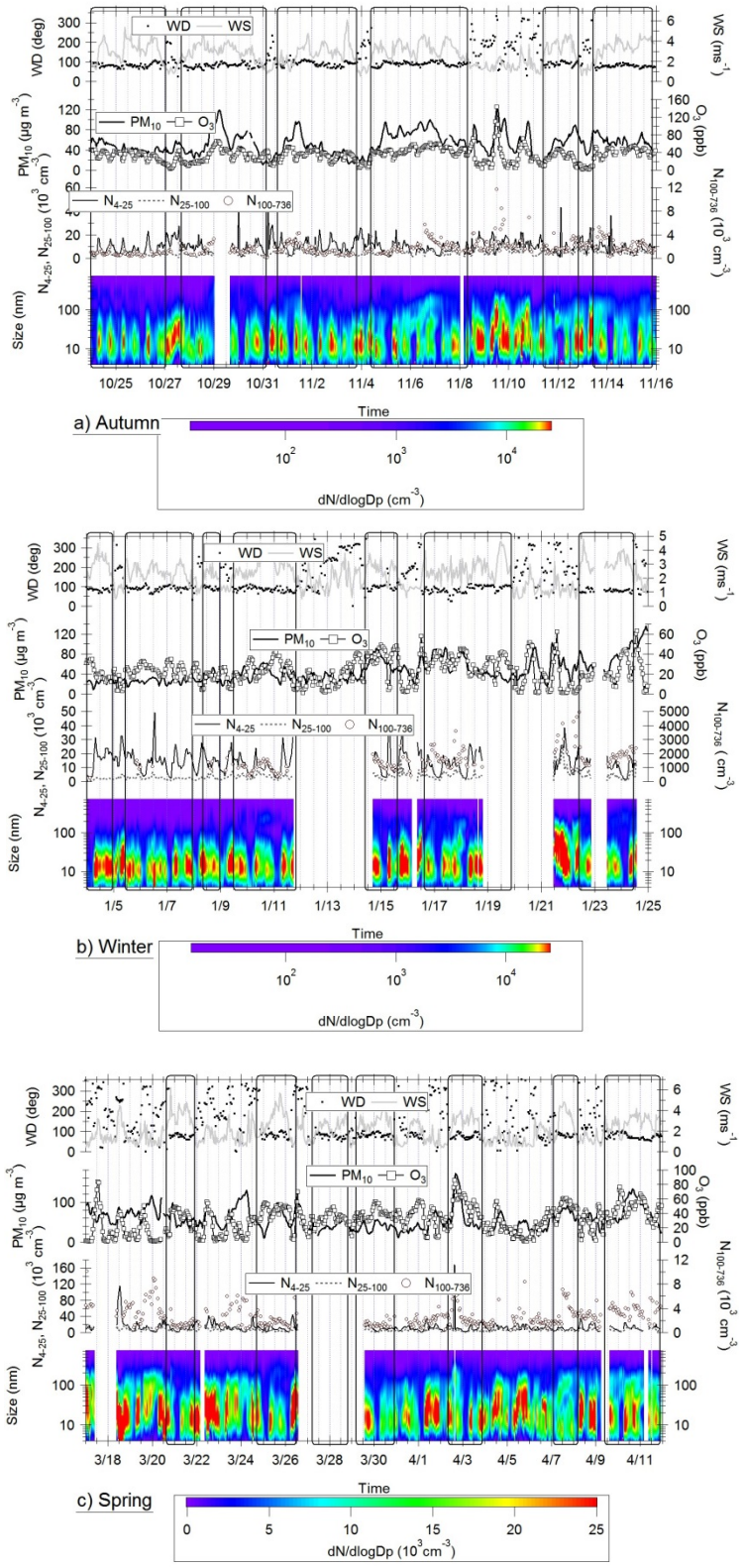


**Figure S1**. Time series of measured parameters during **(a)** autumn, **(b)** winter and **(c)** spring, the periods under the influence of continental outflow were highlighted. From the bottom to top: PSD, the $N_{4-25}$, $N_{25-100}$, $N_{100-736}$, $PM_{10}$, ozone ($O_3$) and wind direction/speed.