Supplemental Information

Evaluation of Fast Mobility Particle Sizer (FMPS) for Ambient Aerosol Measurement

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Figure S1. Meteorological data obtained from the California Irrigation Management Information System (CMIS) meteorology station at UC Riverside (33.965°, -117.336°) for March 8th. a) Wind direction and speed; b) Ambient temperature; c) Relative humidity; d) Back trajectory (12 hr) analysis, initiated at 15:00 on March 8, 2017 Local Time (before the transition period); and e) Back trajectory (12 hr) analysis, initiated at 21:00 on March 8, 2017 Local Time (after the transition period).
NOAA HYSPLIT MODEL
Backward trajectory ending at 2300 UTC 08 Mar 17
HRRR Meteorological Data

Source ★ at 33.97°N 117.34°W

Meters AGL

Job ID: 131054
Job Start: Wed Sep 30 00:40:23 UTC 2020
Source 1 lat.: 33.965000 lon.: -117.336000 height: 100 m AMSL

Trajectory Direction: Backward Duration: 12 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 1800Z 6 Mar 2017 - HRRR V1
Figure S2. a) Time series of ultrafine (9-100 nm) particle number concentration from SMPS and different FMPS matrices; b) Correlation of ultrafine particle number concentration between SMPS and different FMPS matrices for the time period from 12:30 to 23:00; c) Correlation of ultrafine particle number concentration between SMPS and different FMPS matrices for the time period from 12:30 to 18:00; and d) Correlation of ultrafine particle number concentration between SMPS and different FMPS matrices for the time period from 20:00 to 23:00.
Figure S3. a) Time-resolved geometric mean diameter from SMPS and FMPS for ultrafine particle size range (9-100 nm); b) Correlation between SMPS and FMPS geometric mean diameter for ultrafine particle size range (9-100 nm) for the time period from 12:30 to 23:00; and c) Correlation between SMPS and FMPS geometric mean diameter for ultrafine particle size range (9-100 nm) for the time period from 20:00 to 23:00.
c) after 20:00

- \( y = 1.14x + 4.13 \)
  \( R^2 = 0.97 \)

- \( y = 1.2x - 0.56 \)
  \( R^2 = 0.96 \)

- \( y = 1.09x + 1.85 \)
  \( R^2 = 0.95 \)
Figure S4. a) Time series of CS mode ultrafine particle number concentration from SMPS and different FMPS matrices (9-100 nm); b) Correlation of CS mode ultrafine particle number concentration between SMPS and different FMPS matrices for the time period from 12:30 to 23:00; c) Correlation of CS mode ultrafine particle number concentration between SMPS and different FMPS matrices for the time period from 12:30 to 18:00; and d) Correlation of CS mode ultrafine particle number concentration between SMPS and different FMPS matrices for the time period from 20:00 to 23:00.
d) after 10:00

- **FMPS-default**
- **FMPS-compact**
- **FMPS-soot**

Equations:
- $y = 0.78x$
- $R^2 = 0.87$
- $y = 0.80x$
- $R^2 = 0.87$
- $y = 0.89x$
- $R^2 = 0.87$
Figure S5. Meteorological data obtained from CMIS Meteorology station at UC Riverside (33.965, -117.336) for March 9\textsuperscript{th}. (a) Wind direction and speed (b) Ambient temperature (c) Relative humidity