

Supplemental Information

According to the analysis of meteorological parameters from ERA5 (i.e., the 5th generation of climate reanalysis dataset released from the European Center for Medium-range Weather Forecasts, ECMWF) over the recent decade from 2010-2019, the annual mean 2-m air temperature at the Gucheng site is 13.6 °C, with a mean temperature of 26.2 °C and -1.4 °C in summer and winter, respectively. The seasonal characteristics of temperature from 2010-2019 can be found in Fig. S1. The annual total precipitation is on average of 402.2 mm, with the highest seasonal precipitation in summer (216.7 mm) and lowest in winter (7.4 mm). In terms of the wind vector, the dominant wind direction is southerly from an annual perspective, which also holds for the winter season. However, in the winter of 2018, while a fair amount of fraction was from the southern direction, the dominant wind direction was northeasterly (Fig. S2).

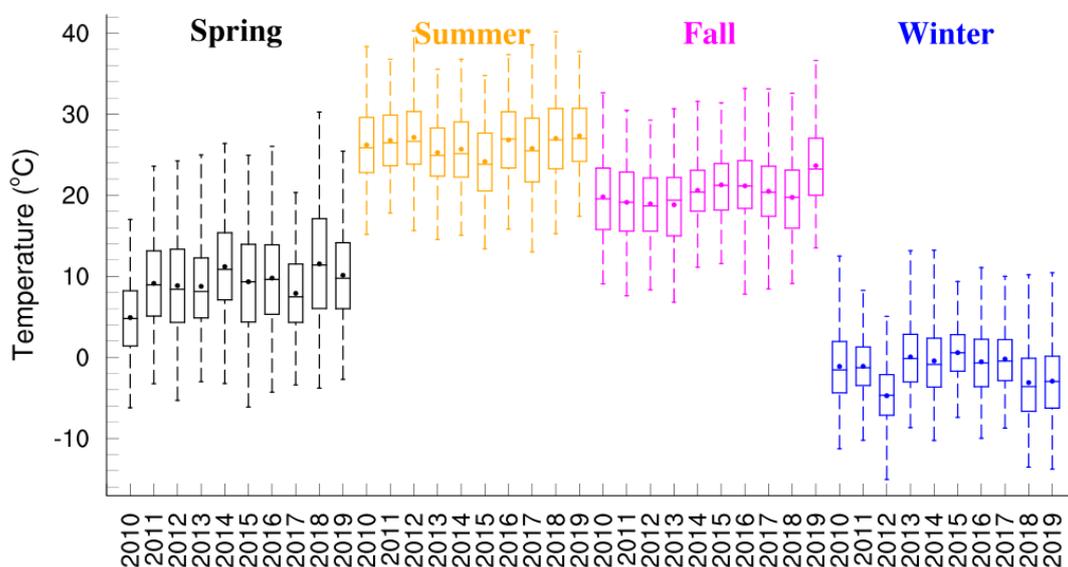


Figure S.1. The box-and-whisker plots showing the minimum, maximum (line end-points), lower quartile, upper quartile (boxes), medians (line inside the box) and average (point inside the box) of hourly 2-m air temperature in Gucheng over each season from 2010-2019.

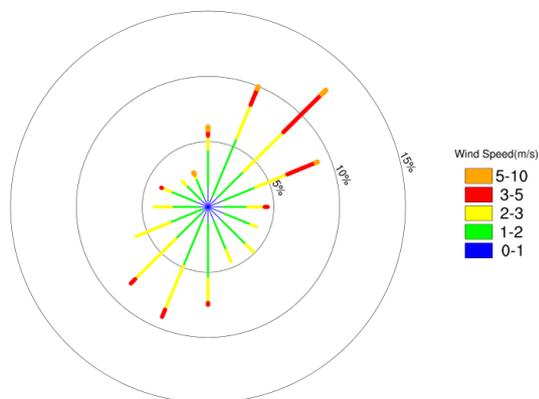


Figure S.2. Wind rose plot in winter 2018. The colors represent the wind speed, and the circles represent the frequency of wind directions with interval of 5%. The direction of each line indicates the wind blowing from the respective direction.

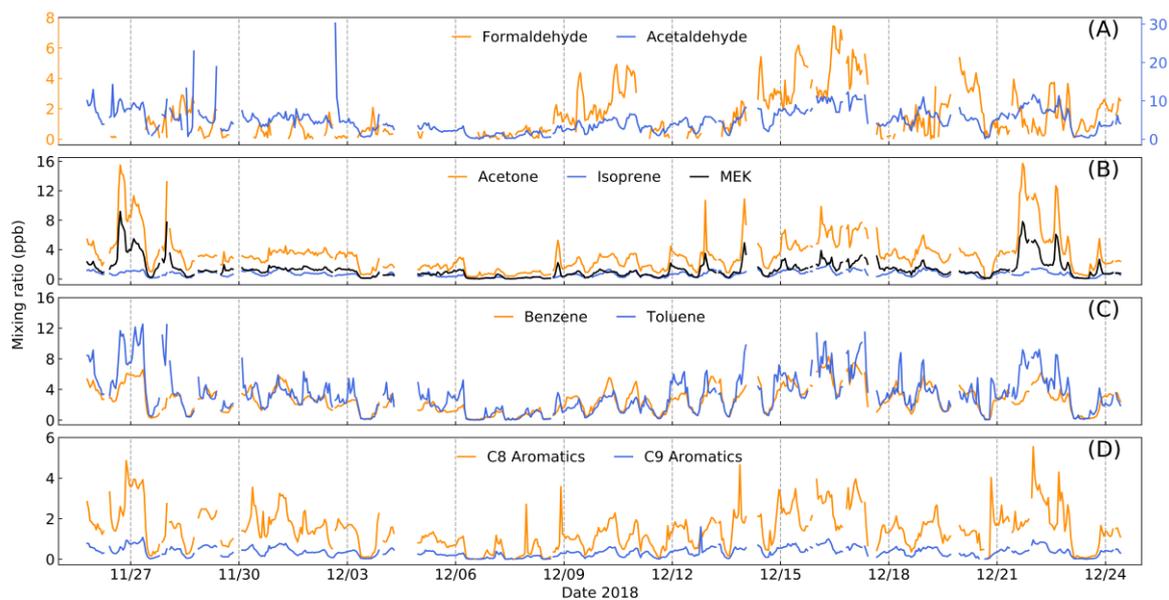


Figure S.3. Time series of the mixing ratio of measured volatile organic compounds (VOCs).

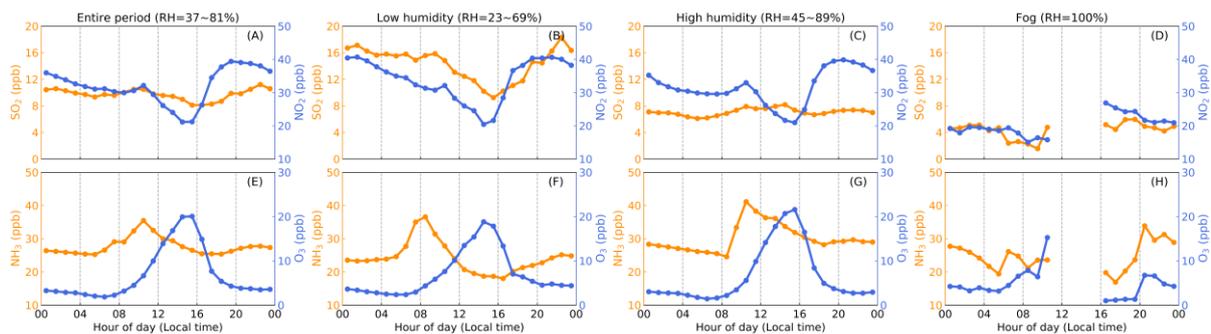


Figure S.4. Diel variations of the measured inorganic gas pollutants averaged over the entire campaign and focus periods with different RH conditions.

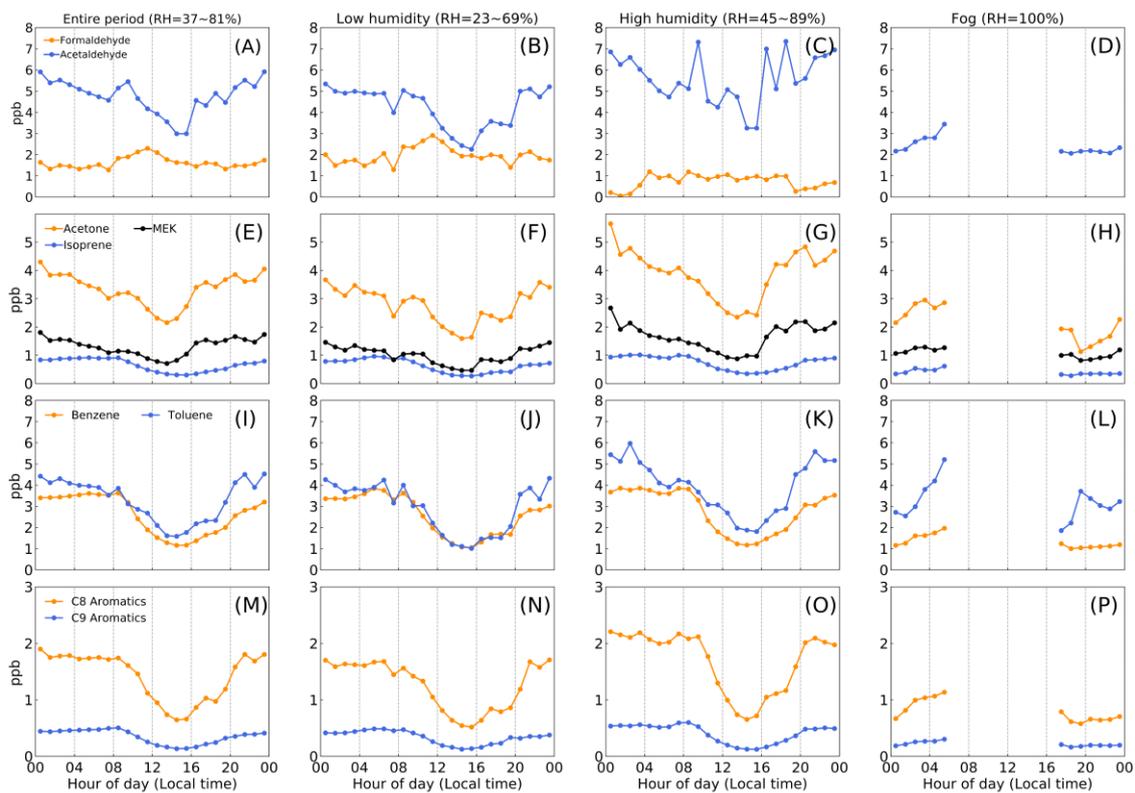


Figure S.5. Diel variations of the measured volatile organic compounds (VOCs) averaged over the entire campaign and focus periods with different RH conditions.

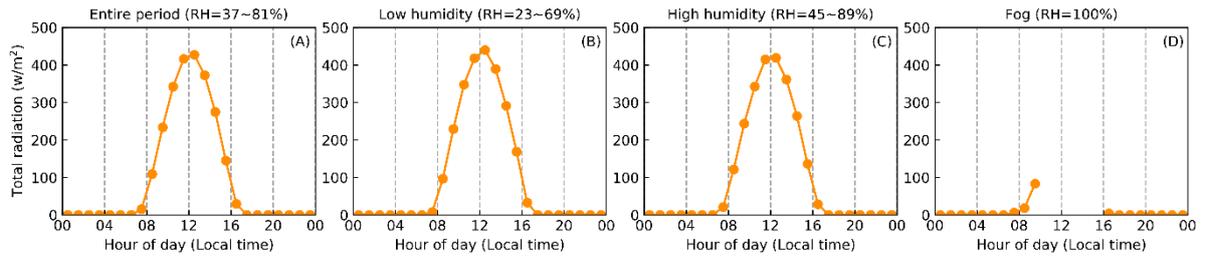


Figure S.6. Diel variation of the solar radiation averaged over the entire campaign and focus periods with different RH conditions.

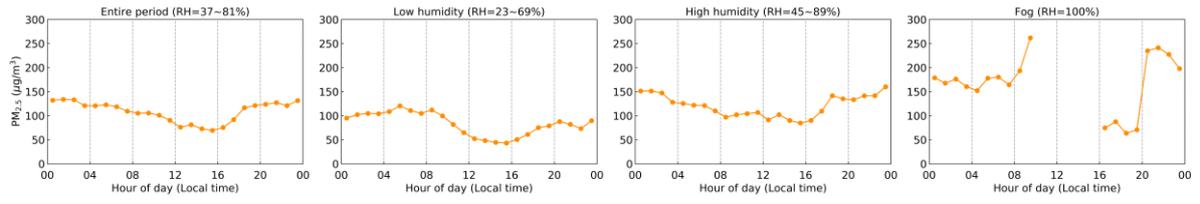


Figure S.7. Diel variation of the mass concentration of PM_{2.5} averaged over the entire campaign and focus periods with different RH conditions.

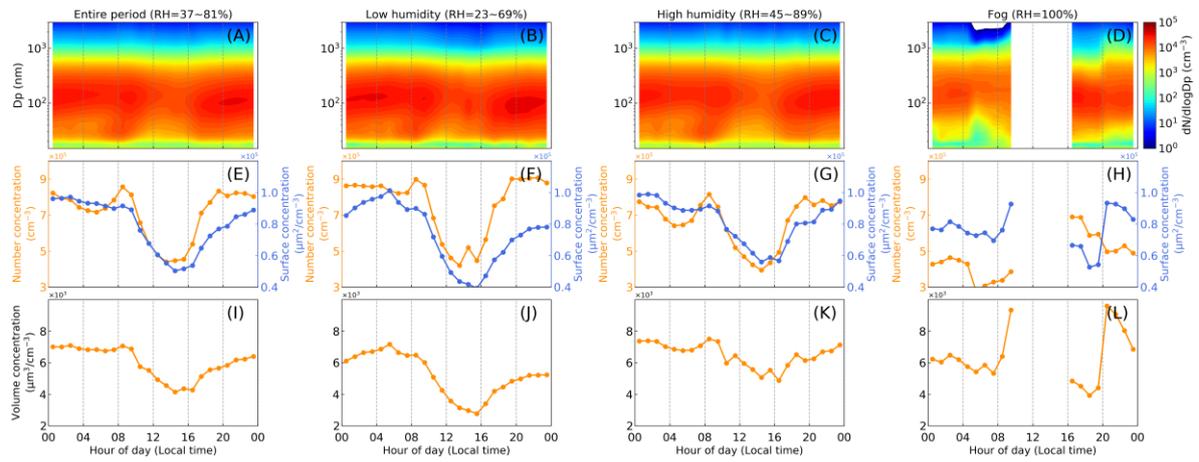


Figure S.8. Diel variations of the particle number size distribution of PM_{10} (A-D) and its respective concentrations (E-L) averaged over the entire campaign and focus periods with different RH conditions.

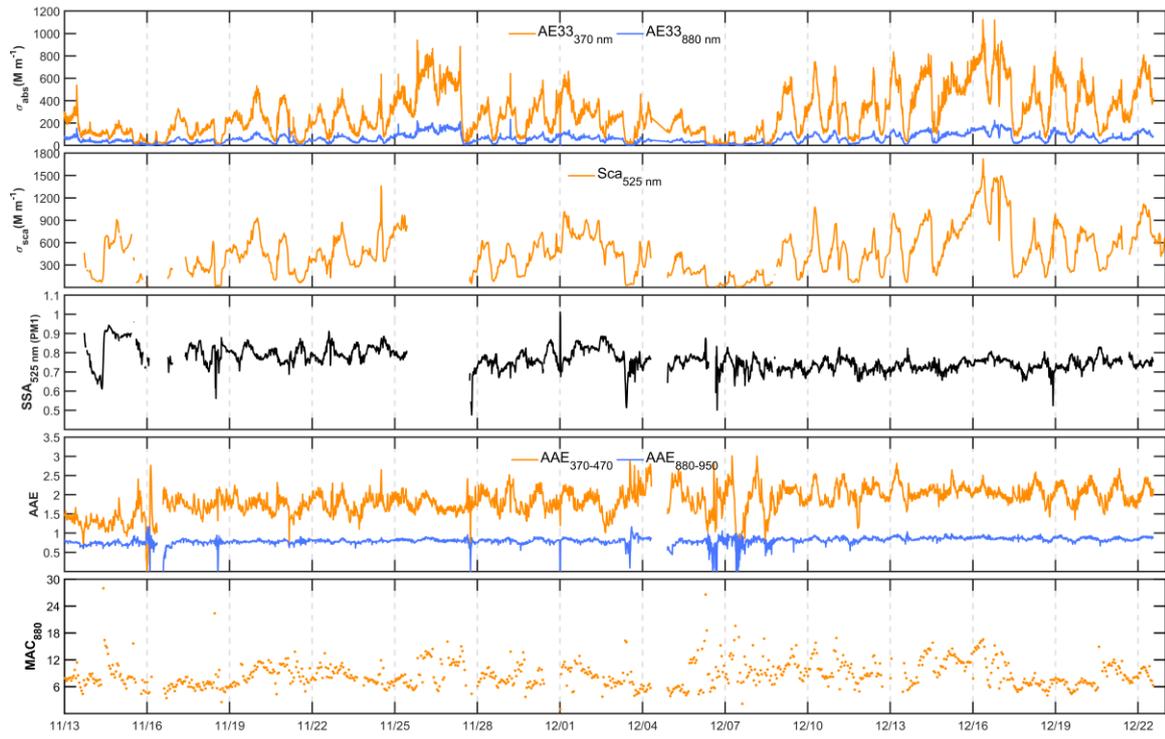


Figure S.9. Time series of the aerosol optical properties.