



Supplement of

Measurement report: Hygroscopicity and mixing state of submicron aerosols in the lower free troposphere over central China: local, regional and long-range transport influences

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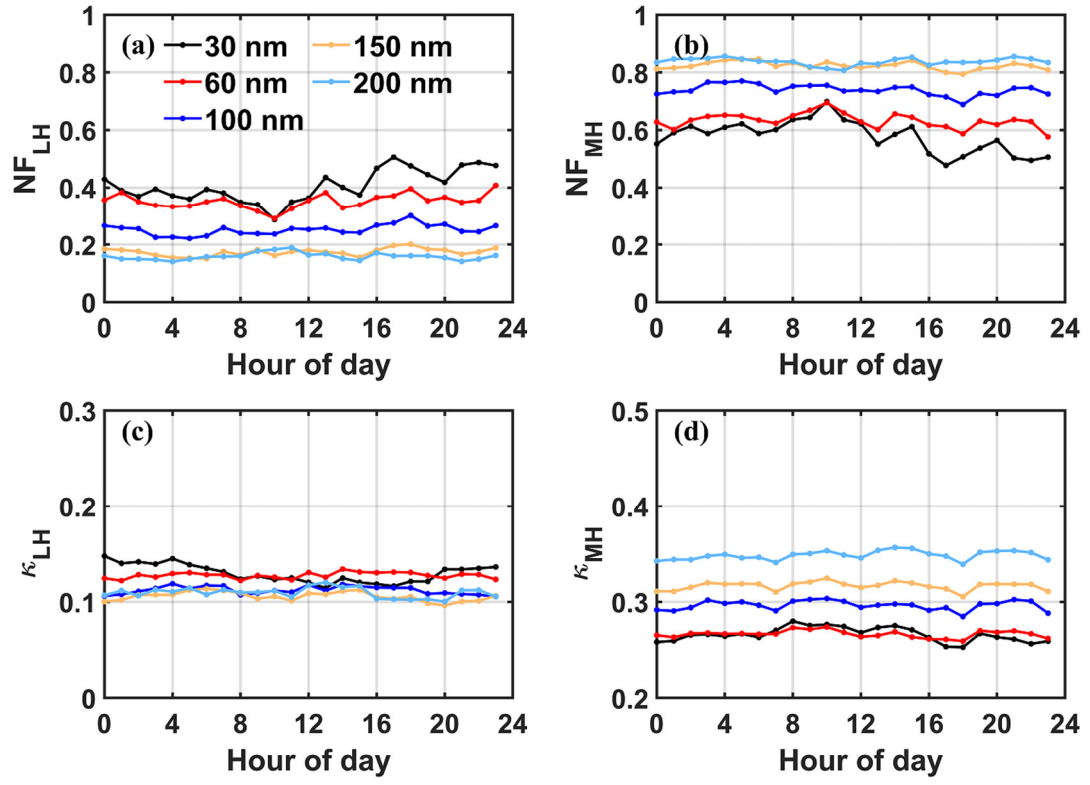


Figure S1. Diurnal variation of the number fractions and individual κ of LH and MH mode particles under the entire campaign.

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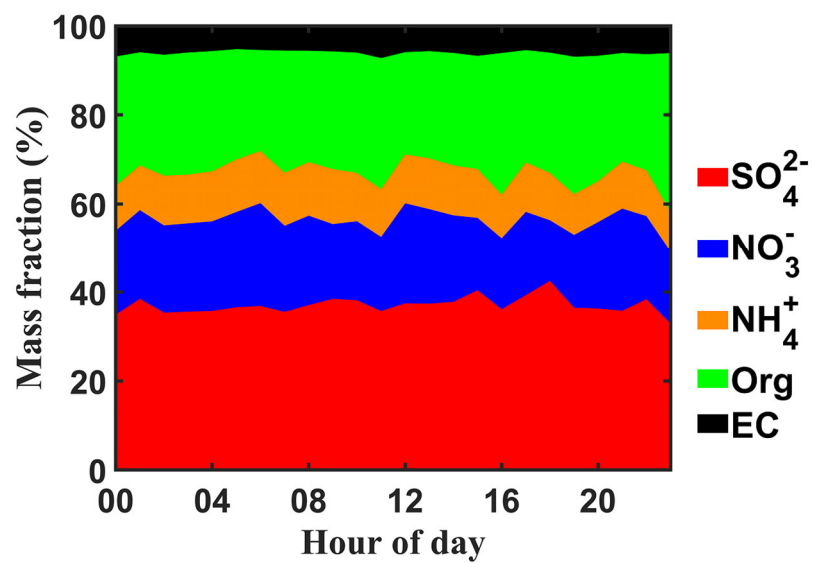
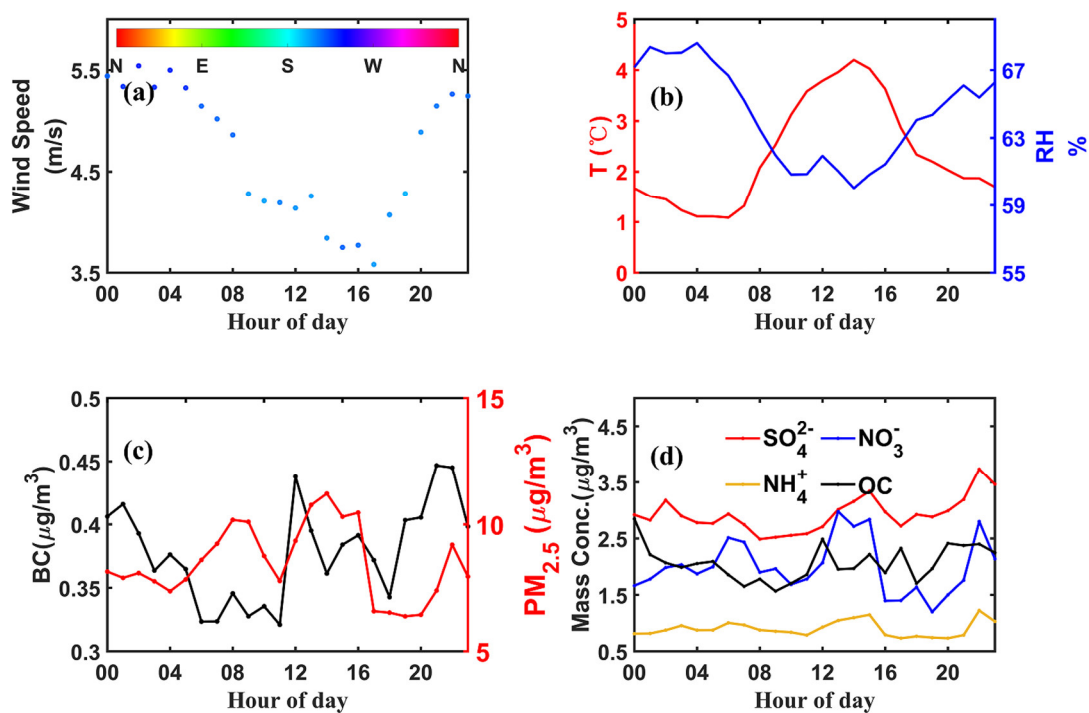
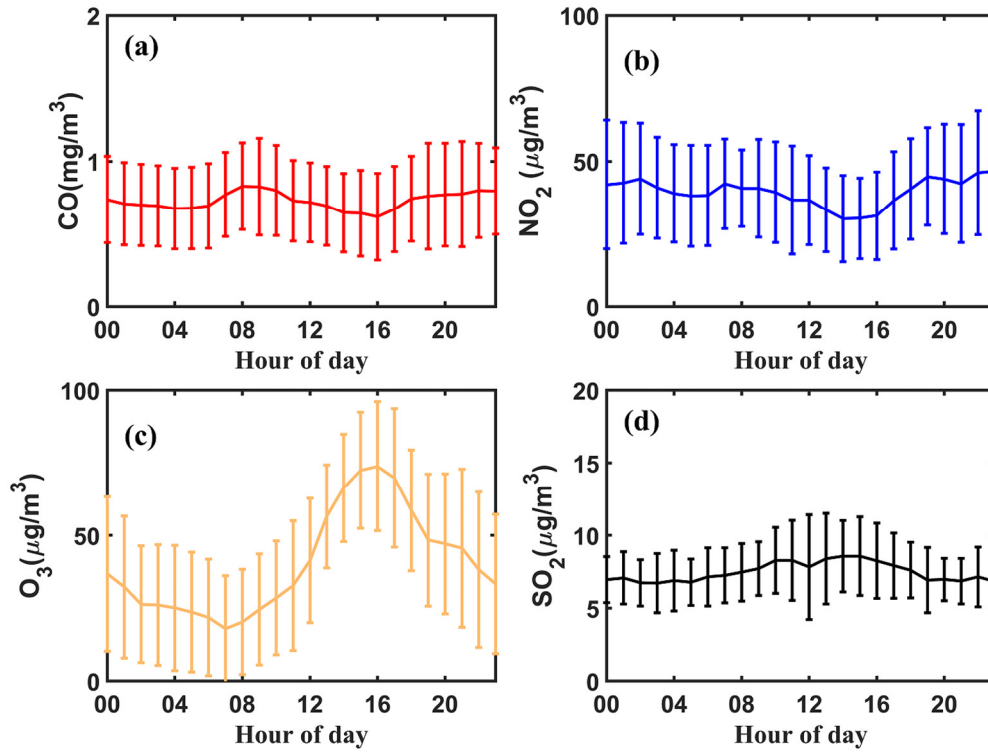


Figure S2. Diurnal variation of average proportions of different chemical components.

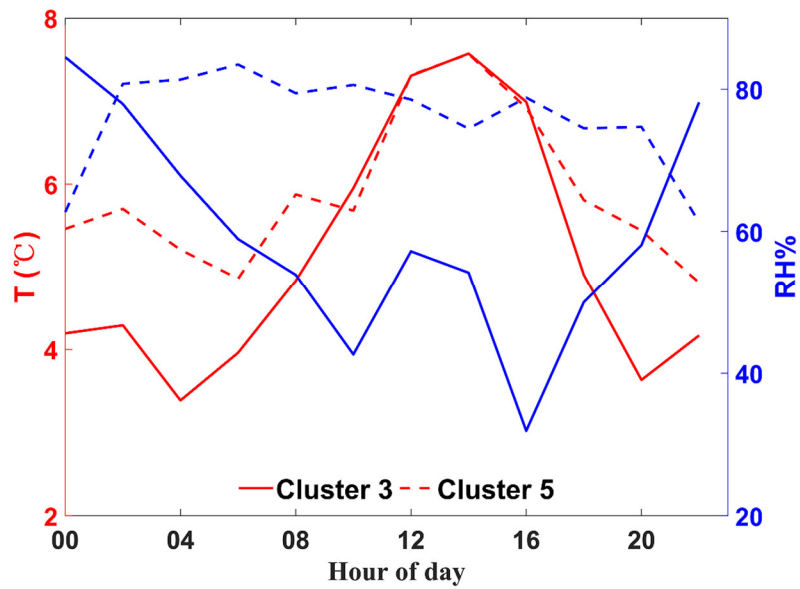


45 Figure S3. Diurnal variation of (a) wind speed and direction, (b) relative humidity and ambient temperature, (c) BC and PM_{2.5} mass concentrations, (d) and the mass concentrations of chemical components (online measurements) during this study.



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Figure S4. Diurnal variations in the concentrations of atmospheric trace gases: (a) CO, (b) NO₂, (c) O₃, and (d) SO₂.



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Figure S5. The diurnal variations in temperature and humidity for Cluster 3 and Cluster 5 during the observation period.

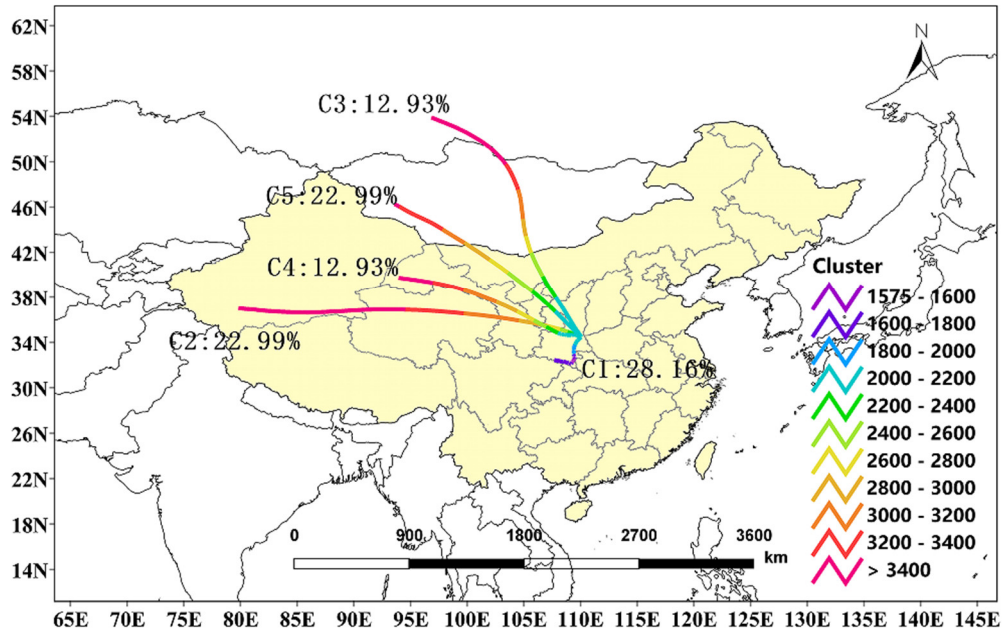


Figure S6. 72 h backward trajectory clusters at 2060 m above ground level. Different colors represent trajectory altitudes in distinct ranges. Percentages indicate the proportion of each cluster.

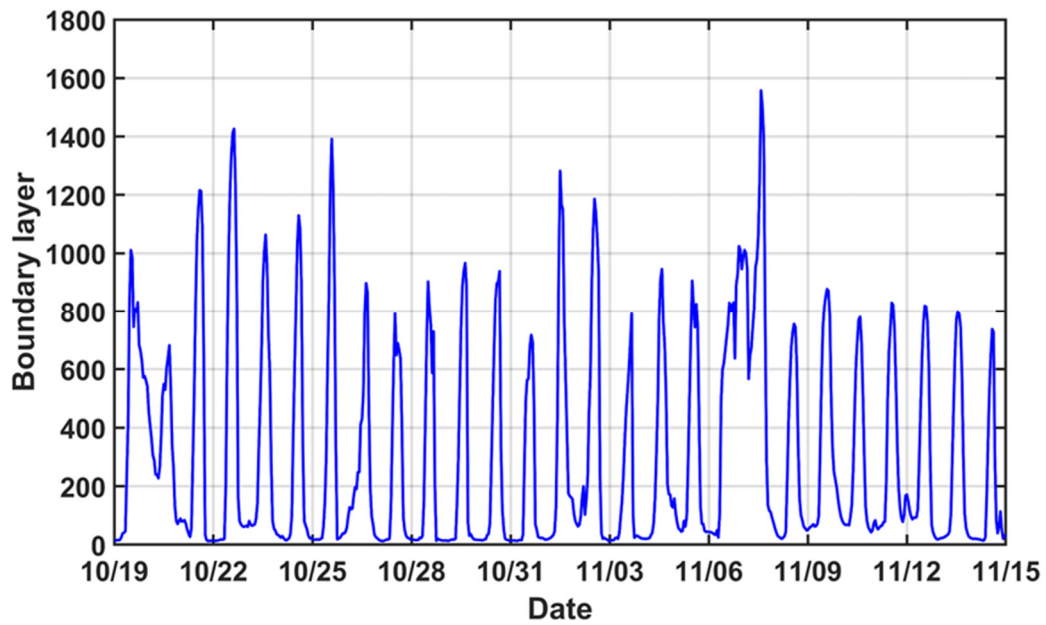
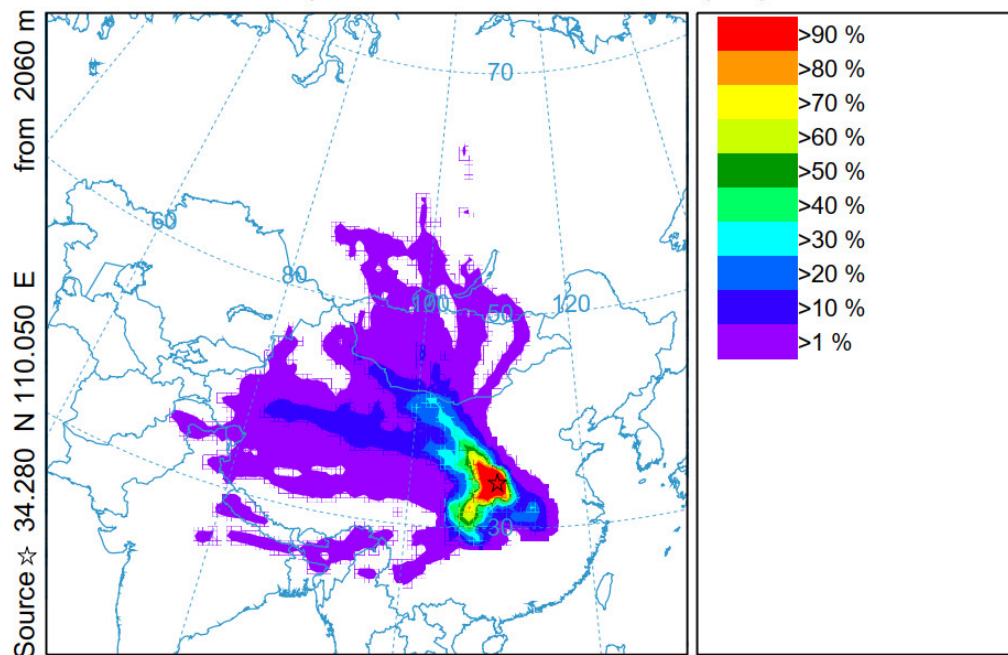


Figure S7. Time series of boundary layer height variations during the observation period.

NOAA HYSPLIT MODEL - TRAJECTORY FREQUENCIES

endpts per grid sq./# trajectories (%) 0 m and 99999 m
 Integrated from 1600 15 Nov to 1900 19 Oct 21 (UTC) [backward]
 Freq Calculation started at 0000 00 00 (UTC)



METEOROLOGICAL DATA

Job ID: 13676 Job Start: Sat Oct 11 01:36:51 UTC 2025
 Source 1 lat.: 34.280000 lon.: 110.050000 height: 2060 m AGL
 Initial trajectory started: 1600Z 15 Nov 21
 Direction of trajectories: Backward Trajectory Duration: 72 hrs
 Frequency grid resolution: 1.0 x 1.0 degrees
 Endpoint output frequency: 60 per hour
 Number of trajectories used for this calculation: 192
 Meteorology: 0000Z 15 Nov 2021 - GDAS1

Figure S8. Backward air mass trajectories with frequency analysis.