

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

Jingnan Shi^{1,★}, Zhisheng Zhang^{2,★}, Li Li³, Li Liu^{4, #}, Yaqing Zhou^{5,6}, Shuang Han⁷, Shaobin Zhang^{5,6}, Minghua Liang^{5,6}, Linhong Xie^{5,6}, Weikang Ran³, Shaowen Zhu^{5,6}, Hanbing Xu⁸, Jiangchuan Tao^{5,6}, Alfred Wiedensohler⁹, Qiaoqiao Wang^{5,6}, Qiyuan Wang³, Nan Ma^{5,6}, Juan Hong^{5,6, #}

¹Institute of Facility Agriculture of Guangdong Academy of Agricultural Sciences, Guangzhou, 510640, China

²Guangdong Provincial Key Laboratory of Water and Air Pollution Control, South China Institute of Environmental Science, Ministry of Ecology and Environment, Guangzhou, 510655, China

³State Key Laboratory of Loess and Quaternary Geology, Key Lab of Aerosol Chemistry and Physics, Institute of Earth Environment, Chinese Academy of Sciences, Xi'an, 710061, China

⁴Guangzhou Institute of Tropical and Marine Meteorology of China Meteorological Administration, GBA Academy of Meteorological Research, Guangzhou, 510640, China

⁵Institute for Environmental and Climate Research, Jinan University, Guangzhou, 511443, China

⁶Guangdong-Hongkong-Macau Joint Laboratory of Collaborative Innovation for Environmental Quality, Guangzhou, 511443, China

⁷Department of Geography, College of Science, Qiqihar University, Qiqihar 161006, China

⁸School of Computer Science and Engineering, Sun Yat-Sen University, Guangzhou, 510006, China

⁹Institute for Tropospheric Research, Permoserstr. 15, Leipzig, 04318, Germany

★These authors contributed equally to this work.

Correspondence to: Juan Hong (juanhong0108@jnu.edu.cn) and Li Liu (liul@gd121.cn)

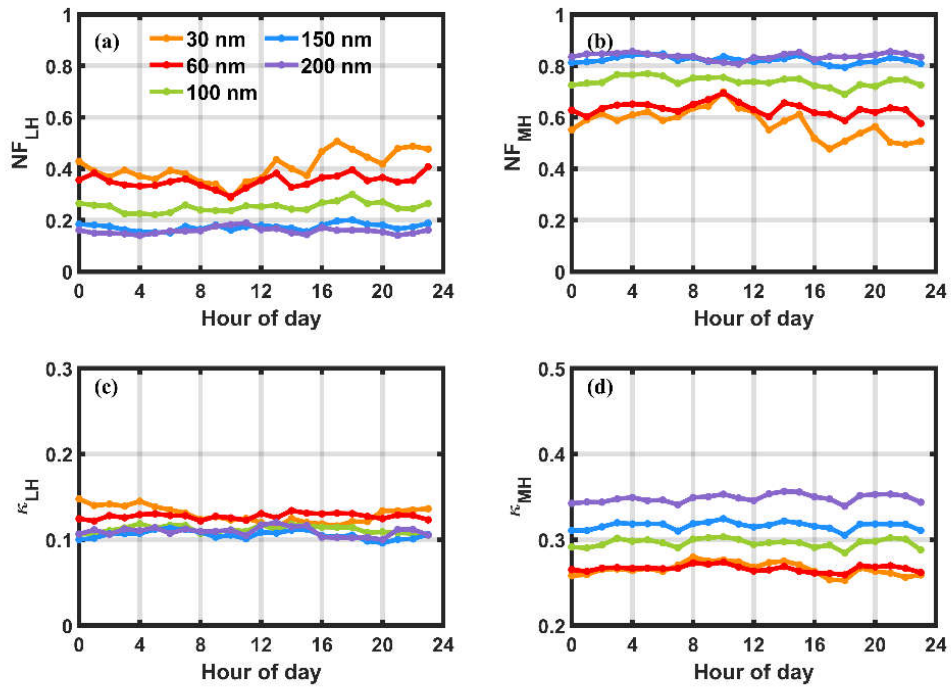


Figure S1. Diurnal variation of the number fractions and individual κ of LH and MH mode particles under the entire campaign.

30

35

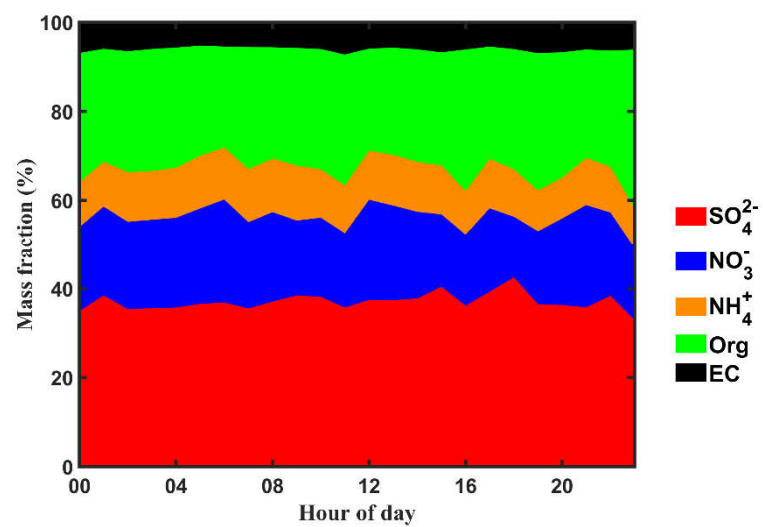
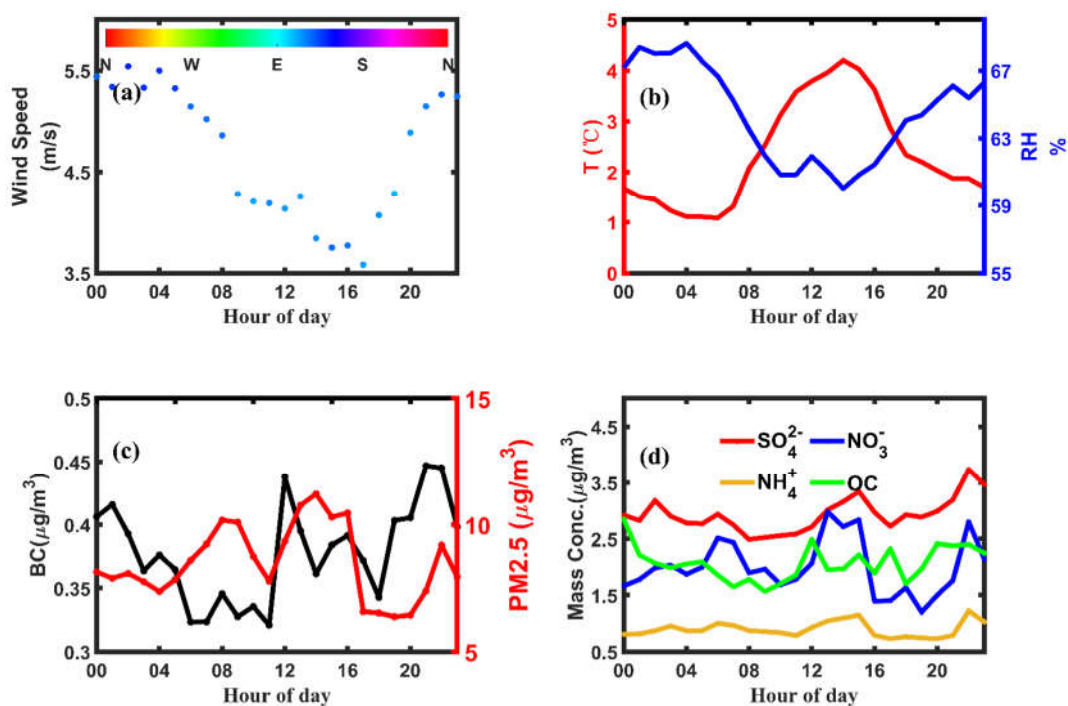


Figure S2. Diurnal variation of average proportions of different chemical components.



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 (URG measurement) during this study.

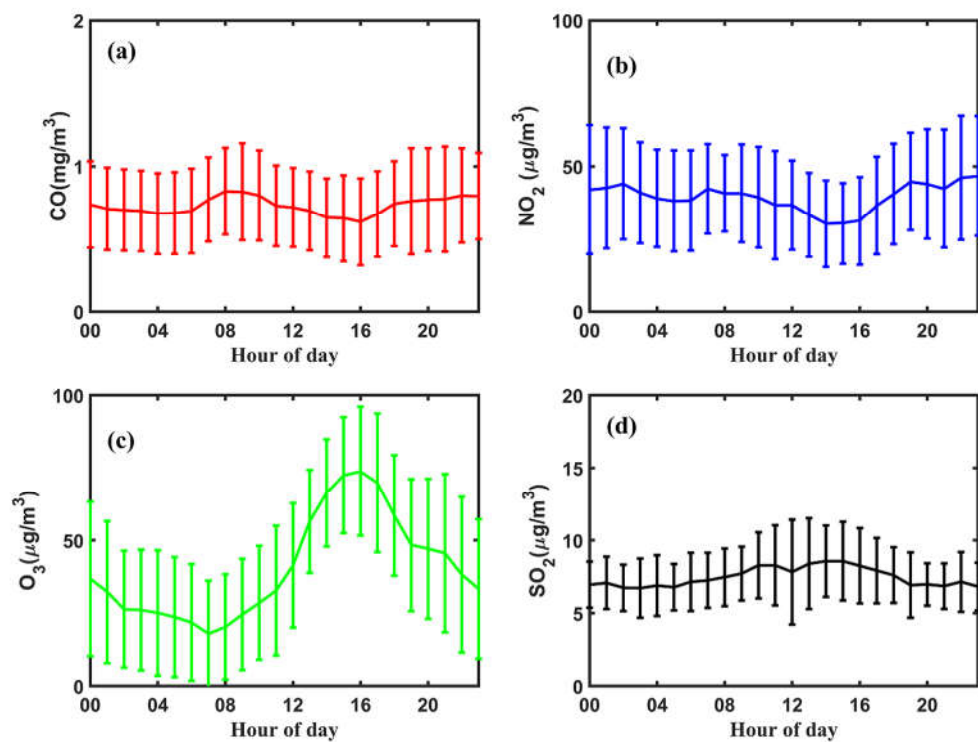


Figure S4. Diurnal variations in the concentrations of atmospheric trace gases: (a) CO, (b) NO₂, (c) O₃, and (d) SO₂.