A new insight of the vertical differences of NO₂ heterogeneous reaction to produce HONO over inland and marginal seas

Chengzhi Xing^a, Shiqi Xu^g, Cheng Liu^{b,a,c,d,*}, Yuhan Liu^f, Keding Lu^{e,*}, Wei Tan^a, Qihou Hu^a, Shanshan Wangⁱ, Hongyu Wu^h, and Hua Lin^h

^a Key Lab of Environmental Optics & Technology, Anhui Institute of Optics and Fine Mechanics, Hefei Institutes of Physical Science, Chinese Academy of Sciences, Hefei 230031, China

^b Department of Precision Machinery and Precision Instrumentation, University of Science and Technology of China, Hefei, 230026, China

^c Center for Excellence in Regional Atmospheric Environment, Institute of Urban Environment, Chinese Academy of Sciences, Xiamen, 361021, China

^d Key Laboratory of Precision Scientific Instrumentation of Anhui Higher Education Institutes, University of Science and Technology of China, Hefei, 230026, China

^e State Key Joint Laboratory of Environment Simulation and Pollution Control, College of Environmental Sciences and Engineering, Peking University, Beijing 100871, China

^f Department of unclear safety, Chia Institute of Atomic Energy, Beijing, 102413, China

^g School of Earth and Space Sciences, University of Science and Technology of China, Hefei, 230026, China.

^h School of Environmental Science and Optoelectronic Technology, University of Science and Technology of China, Hefei, 230026, China

ⁱ Shanghai Key Laboratory of Atmospheric Particle Pollution and Prevention (LAP³), Department of Environmental Science and Engineering, Fudan University, Shanghai, 200433, China

*Corresponding authors: Cheng Liu (chliu81@ustc.edu.cn); Keding Lu (k.lu@pku.edu.cn)



Figure S1. (a) Illustration of the MAX-DOAS setup location on the measurement ship. The red rectangle indicates the ship's exhaust. The blue rectangle represents the MAX-DOAS instrument. The blue rectangle represents the meteorological station. (b) The apparent speed and direction of plume.



Figure S2. The solar radiation intensity (SRI) during the whole campaign.