Supplement of

New particle formation induced by anthropogenic-biogenic interactions in the southeastern Tibetan Plateau

Shiyi Lai[1], Ximeng Qi[1, 2], Xin Huang[1, 2], Sijia Lou[1, 2], Xuguang Chi[1, 2], Liangduo Chen[1], Chong Liu[1], Yuliang Liu[1, 2], Chao Yan[1, 2], Mengmeng Li[1], Tengyu Liu[1, 2], Wei Nie[1, 2], Veli-Matti Kerminen[3], Tuukka Petäjä[3], Markku Kulmala[3] and Aijun Ding[1, 2]

[1] Joint International Research Laboratory of Atmospheric and Earth System Sciences, School of Atmospheric Sciences, Nanjing University, Nanjing, China

[2]Collaborative Innovation center for Climate Change, Nanjing, Jiangsu Province, China

[3]Institute for Atmospheric and Earth System Research, Faculty of Science, University of Helsinki, Helsinki, Finland

Correspondence to: Ximeng Qi (qiximeng@nju.edu.cn) and Xin Huang (xinhuang@nju.edu.cn)

Contents of this file

Section S1. The contribution of NPF to CCN

To estimate the number of Cloud Condensation Nuclei (CCN), we used a tracer-based method as described in Kulmala et al. (2016). Black carbon (BC) was used as the indicator for primary aerosol particles. Here, we used the number concentration of particles larger than 50 nm (referred to as $NC_{>50\ nm}$) as a proxy for CCN. The number concentration of primary CCN was obtained using the following equation:

$$NC_{>50nm,\ primary} = \mathrm{S1} \times [\mathrm{BC}]$$

where [BC] represents the BC mass concentration, and S1 is a semi-empirical scaling factor. The S1 was determined from the relationship between the simultaneous measurements of $NC_{>50\ nm}$ and [BC]. Specifically, 0.5% of the data points in the $NC_{>50\ nm}$ vs. [BC] scatter plot fell below the line S1×[BC]. Finally, we obtained the number concentration of secondary CCN using the following formula:

$$NC_{>50nm,secondary} = NC_{>50nm,total} - NC_{>50nm,primary}$$

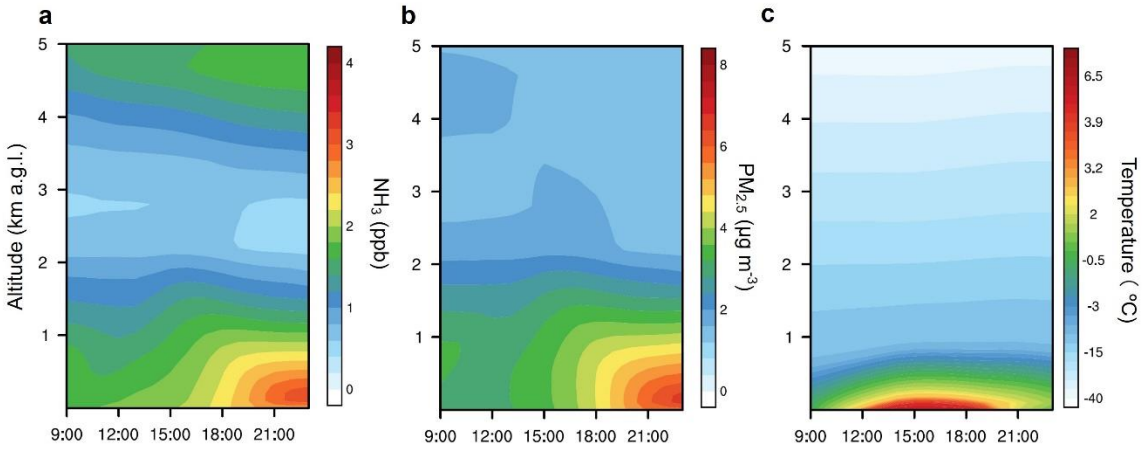

Figure S1. (a) Averaged diurnal evolution of vertical cross section of simulated NH_3 concentrations over region indicated by pink dashed rectangle in Fig. 6a during 28–30 April. (b) Same as Fig. S1a but for $PM_{2.5}$ concentrations. (c) Same as Fig. S1a but for air temperature.

References

Kulmala, M.; Luoma, K.; Virkkula, A.; Petaja, T.; Paasonen, P.; Kerminen, V. M.; Nie, W.; Qi, X. M.; Shen, Y. C.; Chi, X. G., et al.: On the mode-segregated aerosol particle number concentration load: contributions of primary and secondary particles in Hyytiala and Nanjing, Boreal Environ. Res., 21, 319-331, 2016.