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Supplement of

Measurement report: Exploring NH_3 behavior in urban and suburban Beijing: comparison and implications

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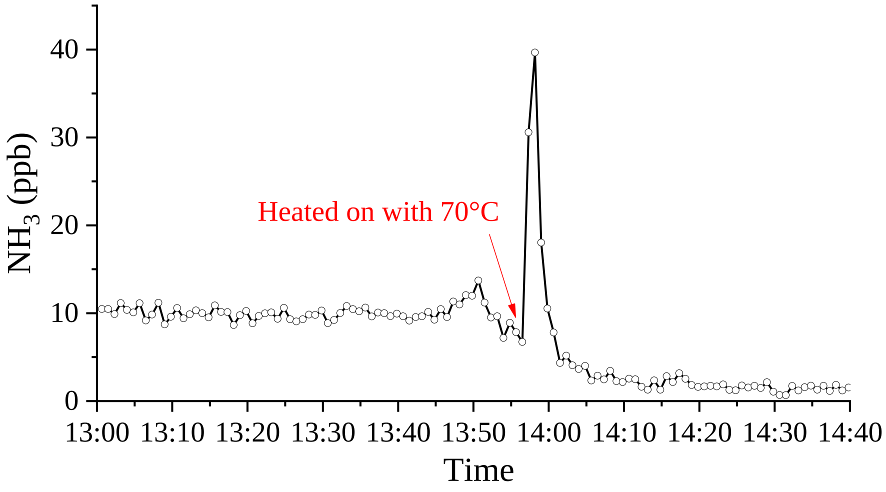

Figure S1. New balance established in 5–6 min after inlet heated. When heating (70℃) was on, there did have a peak lasting several minutes and then deceasing to the normal levels in ambient air, which means a new balancing process has been established. Heated filters are not suggested here because it will promote the thermal decomposition of ammonium salt in the particulate matter accumulated at the filter.

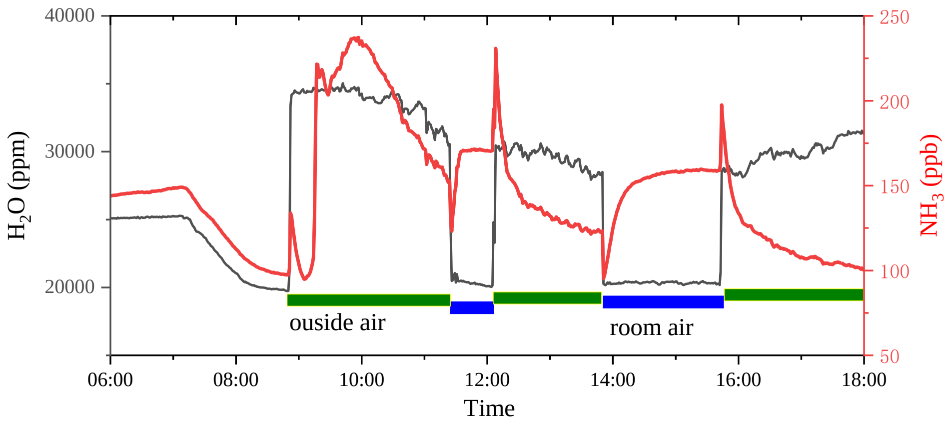

Figure S2. The response of NH_3 and H_2O as the sample air was switched between room air and outside air. Graph is plotted with 1-min average data. Under these extreme changes of H_2O, NH_3 exhibited a response less than 1 hour. The response time is faster when going from low to high concentrations than from high to low one. The test tells us that it's sound to present the NH_3 in hourly mean, although minute-average data might have some limitations.

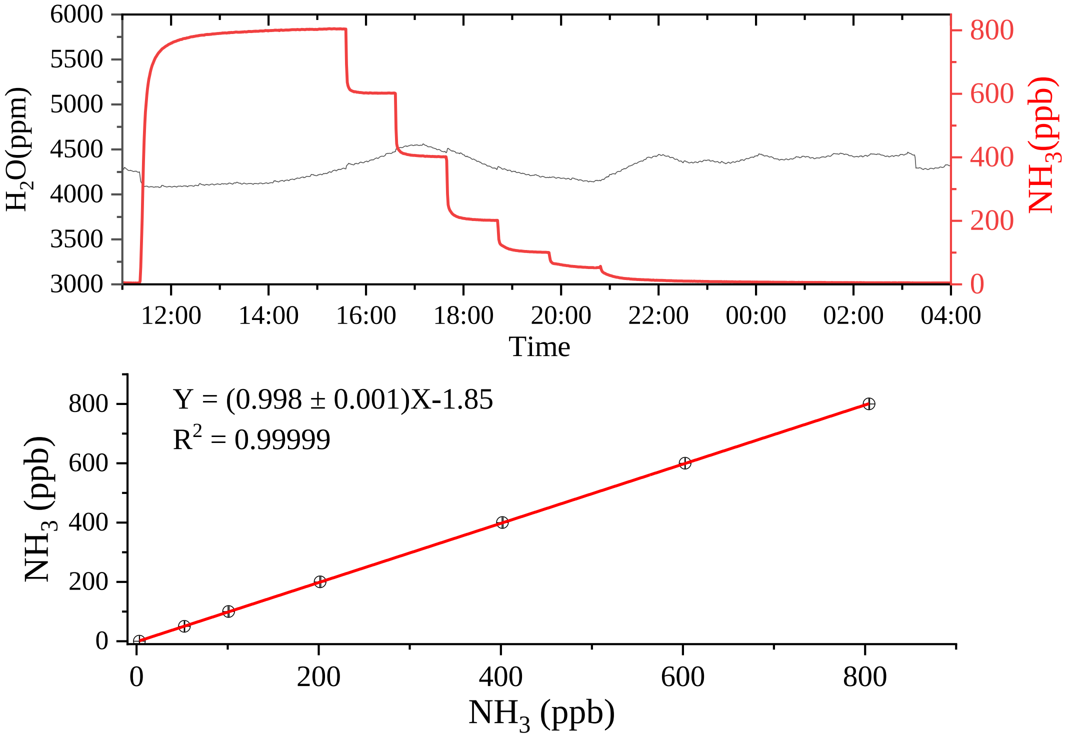

Figure S3. A typical multiple-point calibration of NH_3 analyzer with a cylinder standard gas.

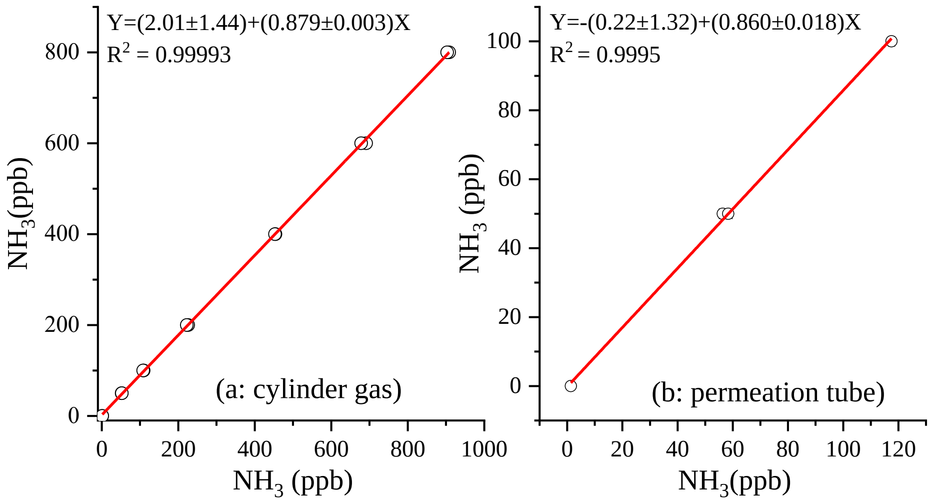

Figure S4. A comparable calibration result from a standard gas cylinder and from a permeation tube

As seen in figure S5, similar correlations of diurnal NH_3 with Temperature(T), relative humidity (RH) were found in spring but different in other seasons at urban and suburban Beijing.

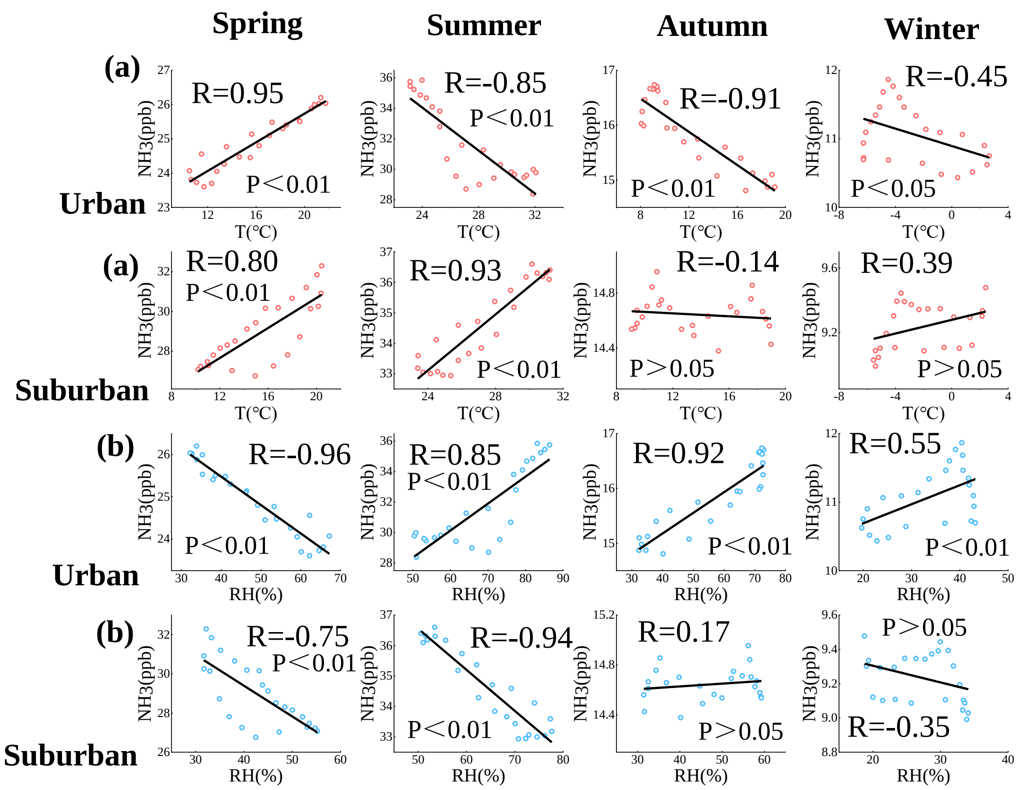

Fig. S5. Correlations of diurnal NH_3 with Temperature(T), relative humidity (RH) in different seasons at urban and suburban Beijing.

As see in Fig. S6, the annul diurnal variations in the NH_3 mixing ratio at the urban site were significantly and negatively (positively) correlated with the temperature (relative humidity). By contrast, the annual diurnal variations in the NH_3 mixing ratio at the suburban site were significantly and positively (negatively) correlated with the temperature (relative humidity). In general, the diurnal behaviors of NH_3 with temperature and relative humidity were different at the urban and suburban sites.

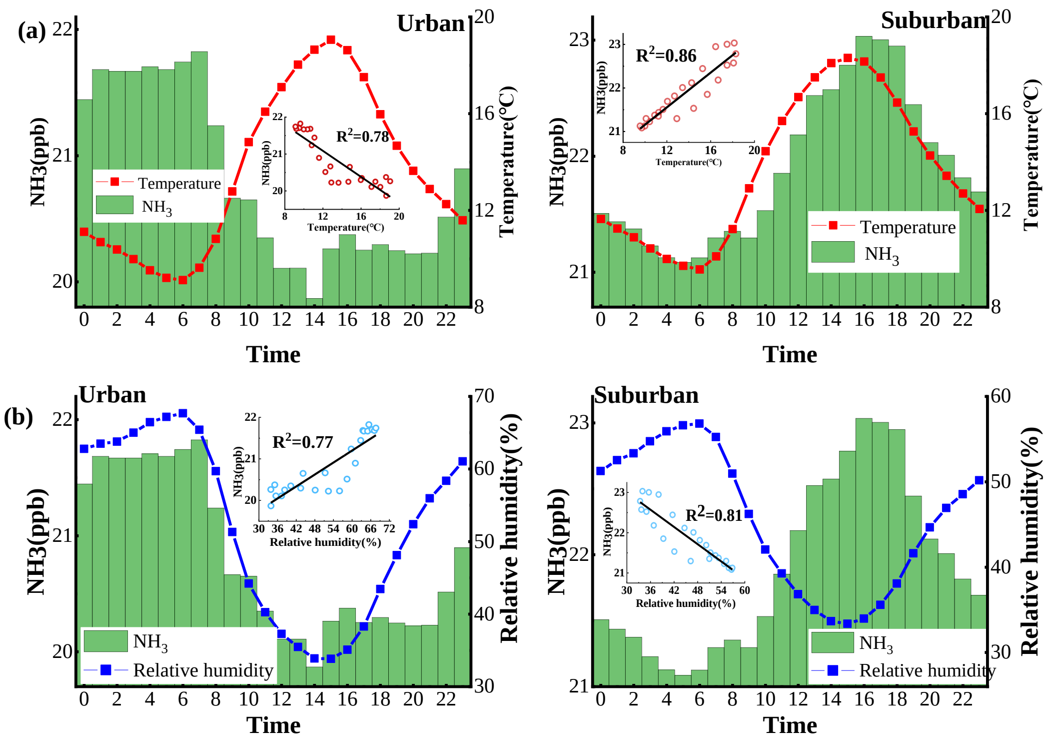

Fig. S6. Annual diurnal variations in and correlations between the NH_3 mixing ratios and temperature (a), relative humidity (b).

As see in Fig. S7, the NH_3 mixing ratios at both sites increased with the relative humidity at the same temperature and increased with the temperature at the same relative humidity. The maps were plotted using all the measurement data.

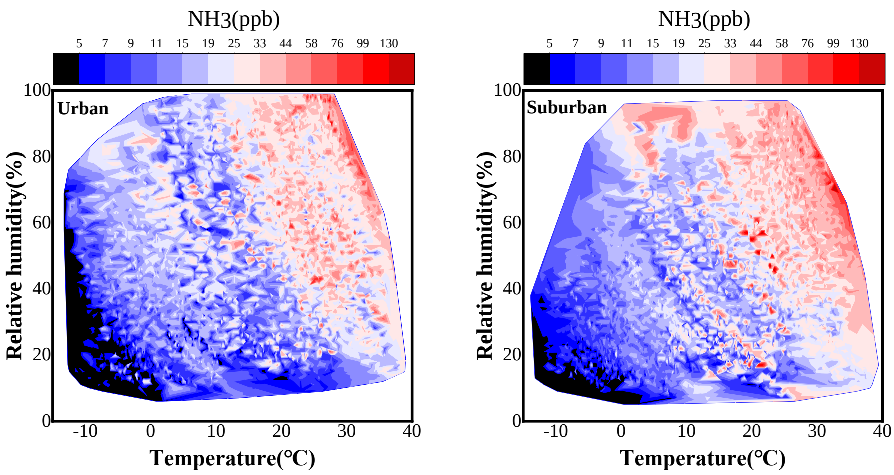

Fig. S7. Contour maps of the NH_3 mixing ratio, temperature, and relative humidity at urban and suburban sites in Beijing.