

Interactive comment on “The importance of vehicle emissions as a source of atmospheric ammonia in the megacity of Shanghai” by Y. H. Chang et al.

Anonymous Referee #1

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The manuscript attempts to explain the observation of atmospheric ammonia in the urban atmosphere of Shanghai. The results are interesting and worthy of publication. This reviewer has a few minor comments for the authors considering. 1) P34728, line 5, “the NH₃ concentrations varied between 0.03 and 39.2 μg m⁻³” This reviewer didn't believe that the detection limit of the MARGA can be as low as 0.03 μg m⁻³ because of highly non-linear response of NH₄⁺ in the system. 2) P34728, lines 7-10, “This might be expected since Beijing and Xi'an are located in the North China Plain (NCP) and the Guanzhong Plain (GZP), respectively, two of the most intensive agricultural production regions in China.” It is very difficult for this reviewer to understand that Beijing is one of the most intensive agricultural production regions in China. 3) P34729, lines 11-12

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“Smaller seasonal temperature differences and less agricultural activity in Shanghai could be the contributing factors.” This could be reasons, but more direct evidences are needed. 4) P34730, lines 3-8, “Although 19.6 mm of rainfall in the July period would be expected to lower NH₃ levels, the temperature on this high concentration date (28.4 °C) was much higher than on the low concentration March date (4.7 °C). Over a longer time frame, even though rainfall in summer was around twice the amount of rainfall in other seasons, other factors such as greater NH₃ emissions at higher temperature outweigh the wet scavenging effects of rainfall yielding higher summertime NH₃ concentrations.” The analysis needs to be revised. More and more on-line observations indicated that rainfall enhanced NH₃ emissions. 5) Section 3.2, to this reviewer, the correlation analysis was valid only if atmospheric NH₃ was derived from local sources. This has to be clarified. 6) Section 3.3, in the morning, it has been well demonstrated that dew evaporation can also lead to the elevation of atmospheric NH₃. This should be added in the revision. 7) Section 3.4, Tunnel is an ideal place to study vehicle emission factors of NO_x, CO and BC, etc. This reviewer has concerns whether it is applicable to study the vehicle emission factor of NH₃. The potential biogenic emission of NH₃ in the ventilation system could be huge because of huge N sources for bacteria.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 34719, 2015.

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