

Interactive comment on “Modeling Atmospheric Ammonia using Agricultural Emissions with Improved Spatial Variability and Temporal Dynamics” by Xinrui Ge et al.

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Received and published: 27 April 2020

In this study, the authors develop a new system to estimate ammonia emission over Germany and Benelux. They compare their results to measurements such as the ones from the IASI mission. I have few advices in the use of these observations. In their manuscript, the authors mention they've used the ANNI-NH3-v2.2R-I products and they've filtered the data based on: - on cloud coverage (< 10%), - column values (positive), - relative absolute errors (<75%)

The data should already include only the observations with a cloud cover lower than 10%, so this filter is not necessary. In the use of the positive data, I also suggest using

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the negative columns. It is not straightforward to do it, but by using only the positive columns, the authors will probably overestimate their averages. The use of these negative columns will help you to get a background close to 0. It is something already done for other trace gases, see for example with the IASI HCOOH data: <https://www.atmos-chem-phys.net/16/8963/2016/> (last paragraph section 2.3.1). On the last filter, the authors should justify the 75% threshold. The larger errors given in the IASI data set are often related to the lower NH₃ total columns and, as with the filter on positive columns, the authors take the risk to overestimate their IASI averaged distribution.

Thus, I suggest using the full data set. As currently done in the manuscript, the authors have only kept the large total columns which might explain the differences noticed in the scatterplots (e.g. Figs. 7a and b).

The best advice I can provide is to contact directly the authors of this IASI NH₃ dataset if it was not done before: Martin VanDamme (mvdamme1@ulb.ac.be) and Lieven Clarisse (lclariss@ulb.ac.be).

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2019-979>, 2020.

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