

Interactive comment on “Estimating global surface ammonia concentrations inferred from satellite retrievals” by Lei Liu et al.

Anonymous Referee #1

Received and published: 3 May 2019

This manuscript estimated global surface NH₃ concentration based on satellite retrievals and the temporal variation of NH₃ concentration was also presented. The study was well designed and the results are also important for evaluate NH₃ pollution in the world. The major comments to the manuscript are as follows.

1 Lines 278-280, for comparing the satellite-derived and measured surface NH₃ concentrations, are there any criterions to choose the sites which measured surface NH₃ concentrations? This is because satellite-derived surface NH₃ concentration in a grid (0.25° latitude × 0.25° longitude) is a reflection of the averaged NH₃ concentration in this grid area, but the NH₃ concentration measured at a site may only represent a limited area. For a grid with different sources of NH₃ (e.g., cropland, animal house or feedlot), the NH₃ concentration in this grid may have large spatial heterogeneity, then

C1

how to find a site with the surface NH₃ concentration to represent a grid area?

2 Lines 282-284, for comparing NH₃ concentrations with different methods, the information on how many measuring sites, and where the sites located should be given for each country or region.

3 Lines 284-286, as mentioned in comment 1, the spatial heterogeneity of NH₃ concentration in a grid and the measuring sites location may also cause the differences between satellite-derived and ground-based NH₃ concentration. Thus, this discussion should be added here. Besides, the detection limit and precision for deriving NH₃ concentration using the satellite should be given.

4 Lines 318-320, More details of the location of NH₃ hotspots should be given. In China, where is the eastern China? It seems that there were also NH₃ hotspots in Shanxi, Shanxi, Gusu and Hubei provinces, and there were no hotspot (> 8 ug N m⁻³) in Xinjiang province in Fig. 4?

5. Lines 321-324, in fact, more than half the NH₃ emissions in China is caused by animal production. The higher NH₃ concentration in eastern China can also be caused by animal production. More discussion and supporting data should be provided to strengthen the contribution of animal production on NH₃ concentration. This is also true for US and Europe.

6. Lines 398-402, are there any differences for the seasonal variation of NH₃ concentration in different regions in the world?

7. Lines 486- 488, which sector (crop or animal production) did cause the increase of NH₃ emissions in China in 2008-2015?

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2019-184>, 2019.

C2