

Interactive comment on “An evaluation of IASI-NH₃ with ground-based FTIR measurements” by E. Dammers et al.

Anonymous Referee #2

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This is a review evaluation for the paper titled, “An evaluation of IASI-NH₃ with ground-based FTIR measurements”, by Dammers et al. Given the paucity of NH₃ satellite validations this study provides valuable comparisons results. The authors also provided details responses addressing the technical remarks from the initial evaluation. Thus, there are only a few remaining additional minor technical remarks. One overall point that should be stated clearly is that the IASI observation sensitivity is not taken into consideration in these comparisons given the IASI retrieval approach, which limits the information available to explain the differences seen between the IASI and the FTIR.

1) Section 2.3.1: This section talks about the important spatial and temporal differences between the FTIR and IASI, which is very well done. However, due to the IASI retrieval approach the sometimes equally important vertical sampling difference are not taken into consideration. One sentence should be added stating that this difference cannot

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be determined due to the IASI retrieval and is thus ignored in this comparison.

2) Line 246 change the “which” to a “that”.

3) Section 2.3.2 lines 292-292: It might be more clear to the reader if the following was added to the end of the sentence, “The effect of the lack of the satellite averaging kernel is hard to predict so the satellite vertical sensitivity is not taken into consideration in this comparison.

4) Also, in this section the authors provided a good response in regards to explaining where the x_{sat} IASI profiles are coming from, however, this information was not explicitly added to the text. It would be good to add in some the response provided: The IASI profiles are not fully retrieved profiles but the fixed shape profiles used as an assumption in the IASI retrieval, see Van Damme et al., 2015. These fixed profiles are used for scaling purposes to be able to account for the FTIR averaging kernel. Van Damme, M., Clarisse, L., Dammers, E., Liu, X., Nowak, J. B., Clerbaux, C., Flechard, C. R., Galy-Lacaux, C., Xu, W., Neuman, J. A., Tang, Y. S., Sutton, M. A., Erisman, J. W., and Coheur, P. F.: Towards validation of ammonia (NH₃) measurements from the IASI satellite, *Atmos. Meas. Tech.*, 8, 1575-1591, doi:10.5194/amt-8-1575-2015, 2015.

5) It would be nice to added in the rationale for why total column averaging kernels were not used as discussed in your response. Just a simple statement acknowledging that total column AK could be used, but this should in principle be the same as the procedure used here

6) Line 509: the reference “Shepherd” should be “Shephard” to match the reference list.

Interactive comment on *Atmos. Chem. Phys. Discuss.*, doi:10.5194/acp-2016-141, 2016.

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