Reply to referee 3

We thank the referee for the review and the comments. They will be considered in the revised version of the paper. In the following, the original reviewer comments are given in *italics*, our answer in normal font.

The updated FOCAL retrieval (v3) is presented in this paper. It can process GOSAT and GOSAT-2 data. It has improved capabilities, mostly bigger spatial coverage than its predecesors, new molecular species measured and new processing. It can measure CO2, CH4, H2O, HDO, CO and N2O.
The paper is well written and well presented, and, as such, deserves publsihing. Some minor comments would improve the readability of the paper.
Unfortunately, it has been written in a manner that serves solely as a reference, since most of the content are references to previous papers. It is therefore very dull to read and has very little "information" appart from some uncertainty figures, sepcially for someone outside of the field . Since the style of the paper cannot be modified substantitally because this would mean a huge effort, I suggest to include the following additions:

1. *It should be stated, in the abstract, the beggining and in section "3.2 Processing" whether the uncertainties of the retrievals are determined. A great emphasis is placed on the amounts derived, but very little in the uncertainties. Are the uncertainties for each individual "pixel" determined? Or can a global uncertainty figure be derived?*

   The uncertainties are determined for each ground pixel. We will clarify this in the revised version as requested.

2. *In line with the previous statement, include a sentence or two describing, in general, the algorithm used for pre-processing, processing and post-processing. Is it something similar to a linear regression? Non-linear regression? Machine learning? Optimal estimation? Please include some phrases such that the reader does not need to read one or two other papers to understand in general terms how the retrieval works.*

   The retrieval is based on optimal estimation. We will include a short description in the revised version.

3. *In the conclusion, for a reader outside from this field, it is not known whether these retrievals will make a difference in the community or not. Do they satisfy the requirements to geographycally locate the sources and sinks of CO2? CH4? Do they satisfy some requirements that can be useful to the communitty? Can they be assimilated in an AC numerical model? If not, which requirements would be needed in future instruments? In summary, a paragraph to show that this work is useful for humanity and not just for the machines that are being fed the numbers.*

   We will add some information about then relevance of the results in the conclusions.