Referee reports on "CAMS-REG-UNC-v8.1: A detailed uncertainty product for the gridded CAMS-REG-v8.1 emission inventory" by Ingrid Super et al.

Anonymous Referee #1, 18 Jun 2026

The paper is interesting, clear and well written.

We thank the reviewer for his/her time to read our paper and provide feedback.

I only have a couple of comments

- even if partly treated also in the conclusion, how an extension of the uncertainty approach to the temporal dimension would work? is this something posing additional challenges? or is it an easy extension? as this would also be a useful implementation

We thank the reviewer for posing this question. The amount of effort required depends a lot on the format of the temporal dataset. We have made a first effort to estimate temporal uncertainties for our default temporal profiles. However, due to the regular data format of our temporal profiles, which consist of diurnal, weekly and monthly profiles, estimating temporal error correlations is extremely complex. Some datasets contain hourly and daily scaling values based on real-time data, for which temporal correlations lengths could be estimated more easily. Moreover, there are many sources of uncertainty that we cannot thoroughly asses due to a lack of data and clear documentation. Therefore, adding temporal uncertainties requires a lot of additional effort. We added a line mentioning this (lines 475-476). Nevertheless, the methodology used in our manuscript could in principle be used for this. Of course, adding an additional dimension would increase the size of the dataset drastically and the optimization might become unfeasible due to computational constraints. This hasn't been tested.

- not-optmized countries: is there a way to deal also with these countries?

The non-optimized countries are included in the dataset, receiving gridded emissions just like all other countries. The only difference is that we do not align the gridded uncertainties with country-level uncertainties, since the latter are not reported. They can be treated just like the optimized countries.

For the rest, no comments from my side. The paper is interesting, well written, and cover a much needed aspect of emission inventories preparation.

Anonymous Referee #2, 08 Jul 2026

The authors have addressed all of my substantive comments and concerns to my satisfaction. I have only one remaining minor point: The figure captions (or legends) of the violin plot should indicate what the horizontal bars represent. Apart from this clarification, I have no further issues to raise.

We thank the reviewer for (again) taking time to review our manuscript. An explanation of the violin plots is presented at the beginning of the results chapter to avoid repetition (lines 295-294).