

We thank the reviewer for this second round of review. The reviewer has two minor comments, which we answer below (in red):

2nd round review on Monteil and Scholze “Regional CO₂ inversions with LUMIA, the Lund University Modular Inversion Algorithm, v1.0”

The revision has improved the manuscript in terms of English and technical description. Some of my concerns on the original submission have been carefully addressed.

The other reviewer and I raised the questions related to the terminology “background” and “foreground”. So, it’s good to see that this confusion got clarified in the revision. In the response to us, not just once, the authors pointed out that some of the studies were not cited because they were submitted after this manuscript. I highly recommend the authors adding those citations to the final submission, which allows them to justify the application of LUMIA.

We have added a sentence in the conclusion, pointing to that paper.

When I said that “comparing other existing systems” in the last round, I meant that it would be appreciated for the authors to emphasize the limitations and strengths of the LUMIA framework compared to other existing systems so that one can select a system that fits their research goal better.

We understand the request from the reviewer, but as already explained in our previous reply, we don’t think that this is something we can provide, at least not in a very meaningful way: LUMIA is intentionally not a system with a very well-defined set of features: the work presented in this paper is representative of the possibilities of the system at the time when the paper was initially submitted, but not of the current or future possibilities. The same goes to a large extent for the other systems, so a comparison, succinct or detailed, would not actually be very informative for the readers (and may even be misleading).

The main strength of LUMIA is its modularity: the code is compact, flexible and portable, which makes it easy to implement new features or to embed it in other projects. This is described at lengths in Section 2 and in the last section of the discussion/conclusions. These qualities are (probably) shared by some of the other recent inversion systems, and these systems may have qualities that LUMIA doesn’t have, but we don’t think that it is the right place for offering a comparison (and the other model description papers don’t generally do that either).

Those points above are minor critiques. There is no need from my end to have another round review after the modification.