To: GMD Topical Editor

From: Glenn Hammond

Subject: Response to reviewer comments and updated submission

Date: January 6, 2022

Response to Dr. Leal's recommendations

- **Reviewer Comment:** I have some aesthetic recommendations. The code boxes should be written with monospace fonts. Some syntax highlighting would be beneficial if possible.

  Author Response: *I have revised the code blocks to use Fortran syntax highlighting and monospace fonts.*

- **Reviewer Comment:** Not sure how viable this is, but the author may want to consider users writing their reaction rates in Python in the future. This can be done sufficiently fast if implemented right and allow users to define their reaction rates with a few lines of code.

  Author Response: *I may consider using Python to define reactions in the future, but I believe that Allan would agree that the comment was more a recommendation than a request, and it is beyond the scope of this paper.*

Other comments

I have made numerous minor revisions to the manuscript to remove minor typos, improve readability and update the code availability section (e.g. updated Zenodo link and PETSc version). Beyond that, the manuscript has not changed.