

## ***Interactive comment on “ESMValTool v2.0 – Technical overview” by Mattia Righi et al.***

### **Anonymous Referee #1**

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This document constitutes the revision of the paper "ESMValTool v2.0: Technical overview" by Mattia Righi et. al. with the code "gmd-2019-226". This paper describes the second version of a tool for analyzing the quality of the output data for the Earth System Models participating in the Coupled Model Intercomparison Project. It compares the results obtained with the current version of the tool (ESMValTool 2.0) with the previous version (ESMValTool 1.0) and explains each new functionality implemented and the reasons why the software has been improved.

In general, this paper is a substantial contribution to modelling science and the results are discussed in an appropriate and balanced way. The traceability of results is very clear except for a couple of details that I question later. As for the structuring of the document, I think it is well written. The structure follows a coherent, clear and concise order. In summary, I consider that this paper constitutes a good contribution, more specifically to software quality in the field of climate model development, but I have

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some questions ordered by relevance that I would like to be solved before making a decision:

- in section 5.3, you describe a continuous integration server to improve code stability, maintenance, and software quality. The tools used to create a continuous integration server are not open-source tools. They have proprietary licenses with a free plan option in which minimum services are offered. Why have not you chosen to use free software tools to create a continuous integration environment? Jenkins, for example, is a solution with these characteristics to manage a continuous integration server and execute automated tests. Another alternative to static code analysis is "Sonarcloud": a tool that detects bugs, duplication and vulnerabilities on code with the possibility to directly integrate with GitHub. Finally, another thing that has caught my attention is that the branches that make up the Git repository are not explained anywhere in the paper or the attached documentation of the software. This makes it very confusing to select and download a specific version of the software, that is, download the version of the master branch, the development branch, preproduction branch... So, I consider necessary an explanation of this, for example in the "readme.md" file;
- When reading the document, the display of some data is a bit tricky: the information of some data are in tables and the position of them is a little uncomfortable when reading. Table 2 is mentioned on page 9 but does not appear until page 16, it could be on page 13 to facilitate its location. Tables 3 and 4 appear before you mention them. They should be mentioned and then appear in a position as close to where they have been mentioned;
- finally, in this paper, the license of the software tool presented is only mentioned one time. Geosci. Model Dev. is a scientific journal that promotes scientific reproducibility and, therefore, open-source/free software. You could place greater emphasis on the type of software license that ESMValTool has to ensure the

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reproducibility of the EMSValTool. Therefore, I think you should highlight the license of the ESMValTool, as well as all the tools used throughout the software life cycle, as I mentioned in the first item and how they can help to improve the reproducibility of the CMIP process.