

## REVIEWER #2

1. **Title: I'm in doubt... Maybe the title should be "A methodology for...". Then, in the article body, on presenting the methodology, there is a workflow to be followed. Maybe the editor has a better view about what to use.**

*Reply: Thank you for this suggestion. To better reflect the methodological nature of the study, we have revised the title to: "A methodological workflow for the..."*

2. **Lines 38/39.- Citations (Gasperini and Ferrari, 1995, 2000) are not in the reference list.**

*Reply: We have added this citation to the reference list.*

3. **Lines 75 and 86.- At line 75 you mention the IPE of Sibol (1987). It is used in Boxer. In line 86 you are referring the IPE of Gomez-Caper at al. (2024). I assume you are using the last one to generate the synthetic IDP; but not in Boxer. Am I right?? Using one IPE for earthquake parameters and another for synthetics does not look very nice (or coherent). I agree it is the easiest way. Other way, you should recompile Boxer.**

*Reply: We agree with the reviewer's comment. We adopted Boxer for consistency and comparison with the CPTI catalogue, which is based on it. The recompilation of Boxer is out of the scope of this paper. In addition, Boxer algorithm is specifically designed to use Sibol's functional form, which explicitly takes epicentral intensity into account and separately considers the attenuation of each intensity degree as a function of each isoseismal area.*

4. **Line 137.- Citation (Tinti et al, 2016) is not in the reference list.**

*Reply: We have added this citation to the reference list.*

5. **Line 174.- I think citation (Pondrelli, 2002) is wrong.**

*Reply: We would like to clarify that the citation "Pondrelli, 2002" refers to the reference of the RCMT catalogue, a dynamic dataset from which the Mw value was retrieved and not to the determination of the moment magnitude of the 2016 Amatrice earthquake. The adopted citation follows the reference provided by the authors of the dataset on the official webpage <https://data.ingv.it/dataset/197#additional-metadata>.*

6. **Line 176.- Maybe on citing Rossi et al, (2019) it should be indicated these data will be called ROSAL019 here. Otherwise, ROSAL019 is found for the first time in figure 3 caption.**

*Reply: We agree with the reviewer's suggestion. We have added in the text of the revised manuscript (see line 181), the acronym "ROSAL019" alongside the citation of Rossi et al. (2019).*

7. **Lines 221/223.- It will be good to give a reference for the problem of saturation exhibited by OLI22.**

*Reply: We agree with the Reviewer' suggestion. We revised the statement in the manuscript by clarifying that the observed saturation behaviour of OLI22 equation refers to the quadratic*

*formulations of the GMICEs proposed by Oliveti et al. (2022), whose regression curves tend to flatten at high PGA and PGV values (see lines 229-232).*

**8. Lines 230/231.- Are you fixing thresholds for BE and RMSE arbitrarily or have you some previous experience on this topic.**

*Reply: The thresholds for BE and RMSE errors were chosen to maintain an acceptable comparison between observed and predicted intensity values. This choice specifically considers the intrinsic uncertainty of macroseismic intensity data, which is of  $\pm 1$  degree. A Between-Event error of  $\pm 0.5$  represents a conservative criterion, corresponding to a maximum discrepancy of only half an intensity degree compared to the observed value.*

**9. Line 281.- Citation (Westaway et al, 1989) is not found in the reference list.**

*Reply: We have added this citation to the reference list.*

**10. Lines 310/314.- Thus, your choice is META\_04 because META\_007 does not fit properly with the geological setting, isn't it??**

*Reply: Yes, that is correct. The selection process of the best-fitting seismogenic source is based on both statistical performance and geological consistency. Although META\_007 shows a good fit with macroseismic observations, providing the lowest  $BE_i$  and  $RMSE_i$  values among the sources derived from macroseismic parameters, its fault trace is not consistent with the active fault structures mapped in the study area. Conversely, META\_004 satisfies the adopted thresholds and shows the best agreement with the Barrea–Castelnuovo fault system.*

**11. Lines 328 and 344.- See note about Pondrelli in the reference list.**

**12. Lines 683/685.- For coherence with the body text (line 327), this reference should start as OGS-RSFVG, Istituto...**

*Reply: The reference has been modified in the bibliography (see line 733) of the revised manuscript.*

**13. Line 688.- Again, for coherence with the body text (line 140), this reference should start as ISC, International...**

*Reply: The reference has been modified in the bibliography (see line 689) of the revised manuscript.*

**14. Lines 745/749.- It should be clarified which article is “Pondrelli et al, 2006a and 2006b”. Check also in the body text.**

*Reply: We have checked and resolved the ambiguity regarding the citations “Pondrelli et al., 2006a” and “Pondrelli et al., 2006b” both in the body text and in the bibliography. In the revised manuscript, the citations have been revised accordingly by referring to the Italian CMT Dataset. The official reference for the dataset (<https://doi.org/10.13127/rcmt/italy>) has been adopted in the reference list.*

**15. Lines 798/802.- Please, check alphabetical order.**

*Reply: We have checked the bibliography and corrected the alphabetical order of the references in this section.*