An Updated, Homogeneous, and Declustered Earthquake Catalog for South Korea and Neighboring Regions, *by Soumya Kanti Maiti and Byungmin Kim*

The paper presents the compilation of a unified earthquake catalog, spanning 1905 to 2023, as well as a declustering analysis using four different methods and a completeness analysis of the compiled catalog.

The paper is very well written and well presented. I have one significant comment and a few minor suggestions –

I will start from the end – in line 696 you write: "This study provides valuable insights into seismic activities in the South Korean region and serves as a foundation for further research to optimize declustering methodologies for enhanced seismic risk evaluation and mitigation strategies." However, I feel that the insights from the work are very limited. What you present is a catalog compilation and a simple comparison between four methods of declustering. Relatively simple and not very inspiring. While you claim that "identifying the most effective method for removing dependent earthquakes is challenging because there is no inherently unique approach, and the elimination results are not absolute." – At the end – when you (or someone else) goes to estimate seismic hazard – you will have to choose one of the catalogs. Which one would you choose and why ? Will you run with all four ? Simply running a comparison is not enough. It has been done before. You don't have to show a full PSHA here, but can you at least estimate ***a*** and ***b*** for a couple of different regions with your four declustering methods and comment about the significance of the difference? Maybe it doesn't make a difference after all? I think this type of analysis can take your paper one step forward and help determine whether or not the differences in the clustering approaches even matter.

Minor comments:

1. Section 2- what are the boundaries of your region of interest (please state those explicitly, the reader does not need to infer them from figures). What are the distances between those boundaries to locations of interest within the peninsula ? In other words- show you are not cutting your region too small compared to the locations you want to compute seismic hazard at. For example- JeJu-Do is about 250 from the nearest boundary, Is that sufficient?
2. Line 221 – the criteria for duplicate events is 70km and 30sec. This is quite arbitrary. What about consistency in magnitude estimations? Is that in the criteria? If you have a M2.0 and a M6.0 occuring at the same time within 70km, are those duplicate?
3. Line 255 – When you average magnitude estimations obtained using different approaches – please provide also the Standard deviation of the magnitude estimate. Not only the average. You can add that to your catalog.
4. Line 265 – It isn't clear which euqation is used – 3 or 4? If only 4 – please do not present Eq3. If both – then what is the criteria ?
5. Line 282- The magnitude of an event cannot be different for vertical and horizontal components. Its a source parameter. It was derived in the original paper, but does not make sense here. If you proceed with the averaging- at least present Std of Mw estimate.
6. Line 345 – I think there is a typo in the distance equation. Why would 1.77 be outside the brackets and 0.037 inside if both are constants?

7. Line 438 – “with particular attention paid to the temporal smoothness of the resulting catalog” – what does that mean? what is temporal smoothness ?
8. Line 466 – I think there is a typo in this sentence in using “of which”. This reads as if you identified 25,229 mainshocks, and 38,069 out of the 25,229 were identified as aftershocks. This does not make sense.
9. Line 511 – This is still the main portion of the text. Give section number instead.
10. Line 540 – ‘bins versus time’ – which time? What is 10, and 100? Is that “time before present” ? If so – then it should say so in the text and figure caption.
11. Section 7 –
    The comparison results from both declustering and completeness analysis should be compared with similar studies in the literature.
    e.g .
    DOI: 10.1007/s10950-024-10221-8
    DOI: 10.1785/0220210127.
    And others..
12. Lines 660 until end of paragraph- There is nothing new stated in this paragraph. There are always more small to moderate earthquakes than large ones. Everywhere. The G-R model shows that, as do others. If you only have reliable data from the past 40 years you probably need models to help you estimate the large events. The text here is trivial.
13. Figure 18 – It is quite hard to gain anything from these figures, and I do not believe you say anything significant about them in the text. Are they really necessary ? What can you say about the geographical distribution that can only be understood from these plots (and not the maps for example) ?