Referee #3

Thank you for the numerous remarks. The changes that you propose are accurate and improve the paper considerably. All your suggestions are included in the manuscript. Here we answer to your questions

The paper it is a valuable and original contribution in the subject of fault source modelling in PSHA. The proposed approach has been used in a SH calculation in Spain with satisfactory results. It would be interesting to check the viability of the model in other parts of the world with faster moving faults.

Nevertheless, there are few issues that, if tackled appropriately, will greatly improve the paper, and I think they should be addressed obligatory before publication in NHESS (please see list below).

Additionally, I attached the manuscript with many comments, suggestions, and corrections, all of them highlighted in yellow and commented using Adobe reader tools.

- Improve the English. Please, for a new submission make sure that the entire article is revised by an English native speaker. The style could also be greatly improved. Avoid the excessive use of “extra comments” in brackets (e.g., page 1, line 9; p.2 lines 17, 30, 31; p.3 line 4, 12;: : : and so many more: : :). I attached the manuscript pdf highlighting that, typos, few mistakes and so.

English has been corrected by a native person in this version.

- Citations. In the introduction there is not a single cite about other previous approaches about incorporating faults as sources in PSHA neither globally nor locally. The authors must cite other previous work in the subject (e.g., Youngs and Coppersmith, 1985; Wesnousky, 1986; Anderson and Luco, 1983; Bungum, 2007; : : :.. and much more recently the different UCERF versions (e.g., Field et al., 2009, 2014), the SHARE project (Woessner et al., 2015),: : : among others. If there are, cite also other previous work done in your study area.

Previous work is cited and referenced (more than 33 new references in the paper)

- Seismic Moment Equation. It is necessary to cite and write the equation used for calculating the seismic moment from magnitude (Mo as function of (Mw), Hanks y Kanamori, 1979, IASPEI, 2005) for a completely comprehension of equation (2) and, later, equation (4). Additionally, you should state before that with the variable “m” you always refer to magnitude in the moment magnitude (Mw) scale.

A reference and the equation of Hanks and Kanamori are included to facilitate understanding the issue

- Equation 4. I assume this equation is an original contribution from this work? Please, you need to show how do you get to equation 4 from Anderson (1979) integral. Need to explain what is parameter d (in relation to Mo f (Mw).

Two equations are included to explain how eq 4 (eq 8 in the new version) is obtained,. All terms are explained

- Equation 10. Further explanations should be given on how you get to equation 10.0

Eq 10 is explained with more detail

- Figure captions. They are very short. More explanations in the captions are needed to fully understand the figures. Particularly figure 2 (see attached pdf).

Figures are explained with more detail

- Figure 5. This figure can be greatly improved from what it is now (a dumped screen). A inset locating geographically the studied area is necessary.

We include this 3D view instead of a map to get an idea of the depth dimension of faults. A location map is included

- Fault sources. The paper will improve greatly if you further explain how did you select the faults and what are there characteristics in terms of slip rate, Mmax, kinematics, etc.

An annex listing the data of faults and faults segments used is included

- Ground Motion Prediction Equation. The GMPE you chose for your calculations was produced to address near fault-source effects. I understand that the point of the paper is to use your methodology for sharing the seismic potential between zones and faults, but because you have chosen this particular GMPE for your calculations you should explore the impact of using it in your hazard results compare to the use of a general GMPE one. I mean, this is important because in your results it is clearly shown that the hazard increases a lot near the faults, as you state p.10 l.3: “The results show an increment of expected accelerations near fault traces (in a factor of 2).” And later: “This increment is achieved at the expense of decreasing expected

accelerations in areas located farther away from faults." This statement should be properly discussed in the Discussion section.

The comparison between the results obtained with both methods must be performed in terms of relative acceleration values because the absolute acceleration values are conditioned by the specific ground motion prediction equation used. To avoid the influence of the GMPE in both results, the same GMPE is used to apply both methods.

However, it remains open the possibility of integrating several GMPE in a logic tree framework to capture the epistemic uncertainty related to path effects. At the same time, it could be included the site effect in the analysis to see if the different source models affect different soil types similarly or not, This paper focuses on the impact of source models in hazard results. The impact of other factors (site effects, GMPE) can be the subject of future studies. This is indicated in the Discussion section.

- Discussion and Conclusion should be separated sections. The paper will improve greatly if you discuss your results in terms of earthquake rates contribution from faults vs zones, instead of accelerations. This way it would be showed the real (pure) impact of your approach in the hazard, without consideration of the GMPE. Subsequently, you can explore the impact of using a different GMPE in the calculations.

The Discussion and Conclusion sections have been separated. The issue regarding the use of GMPE is tackled therein.

- Results. This section should be rewritten. It contains many statements that are better placed in a "Discussion" section. See attached pdf.

The cited sentences are moved to the Discussion section

- References list. There are a couple of references listed but missing in the manuscript.

The reference list is reviewed

- Table 2. Mmax relates to the Max event from the fault. When there is more than one fault in the region, which value do you state on this table? In the range Mmin-Mmax you show the accumulated moment rate from all the faults in the region? How can be regions with MaxC blank? : : : More information is needed to understand this table properly.

Table 2 includes the values of the region, not of faults. Regions without values refer to regions (28, 29, 33 and 40) with no faults identified within their limits. Thus, the distribution of potential between faults and zone is not done in these regions. This is clarified in the table.

- Table 3. More information is needed in the caption to understand it properly. Information on some regions is missed. The MmaxC values are strikingly low: : : What happened to the larger values (big historical events)?

Table 3 shows the values of the catalog that will be used n the distribution of seismic potential. Zones with very low MmaxC value, do not present events with higher magnitude in the catalog (as in region 30). For the rest of the regions, it is included the maximum recorded magnitude equal or lower than MmaxC. Recall that this interval is only to make the distribution of seismic potential, but the higher magnitudes recorded historically are considered in the seismic hazard calculations up t the maximum expected magnitudes.

Please also note the supplement to this comment:

https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2018-28/nhess-2018-28-RC3-supplement.pdf

All these comments have been taken into account