

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC2
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Comment on nhess-2020-387

Anonymous Referee #2

Referee comment on "Modelling earthquake rates and associated uncertainties in the Marmara Region, Turkey" by Thomas Chartier et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2020-387-RC2>, 2021

General comment:

In this work, Thomas Chartier ET al. computed the earthquake rates in the Marmara region with two approaches:
The SHERIFS and the RSQSim. By the first one, the authors model the earthquake rates and explore a logic tree of epistemic uncertainties regarding the locking condition of the fault. They combine this statistical approach to a physical one by means of the simulator RSQSim, which inform the logic tree to obtain weights for the tree branches.

I appreciate the dual approach that helps surpassing the limitations of both methods when individually considered.
since NHESS is focused on modeling natural hazards and this work matches very good the disciplines of the journal, it deserves to be published after minor revisions.

Specific comment:

Given the excellent performance of the method, I wonder if it MAY BE possible TO IMPROVE THE RESULT, perhaps by varying the parameters in the RSQSim simulator (rate and state parameters). In general, I think that the physics-based part gives an important boost to the final result as well as being one of the innovative parts of the work. A better discussion of the results and the highlighting of the actual improvement due to the physical approach could support the article as a whole.

Technical corrections:

Line 72 -> I guess there is a missing reference.

Caption Fig.2 -> I don't see the yellow triangles in figure.

Table 3 -> I suggest to adjust the number of significant digits if the uncertainty values, according to the ones used for the annual earthquake rate.

Line 152 -> M_t is not defined before.

Line 160 -> The sentence "The proportion of earthquakes considered to occur on the faults for each branch is presented in" must be completed.

Line 356 -> I don't understand the number $5 \cdot 10^{-4}$. Please, explain further.