

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC2
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Comment on nhess-2021-280

Anonymous Referee #2

Referee comment on "Ground motion variability in Israel from 3-D simulations of $M \geq 6$ and $M \geq 7$ earthquakes" by Jonatan Glehman and Michael Tsesarsky, Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-280-RC2>, 2022

The authors use 3d simulation model to generate M6 and M7 seismic ground motion for Israel, considering local site effects, and source effects (directivity effects and supershear ruptures). Based on the generated data, they develop a local ground motion model (AM) M based solely on M6 and M7 and few rupture scenarios, and compare it with CB14 model.

The key objective of this work is not clear.

The authors conclude that it is important to develop local GMM for Israel considering local sources, path and site effects.

The authors do not explicitly show the simulation model used, nor the parameters or assumptions.

The authors do not validate the results of their simulations.

The authors claim that the results are model dependent (L414).

The authors do not compare their work with other papers in the region, or hybrid models (eg. please refer to Fayjaloun et al., 2021: Hybrid Simulation of Near-Fault Ground Motion for a Potential Mw 7 Earthquake in Lebanon).

The authors do not clarify their choice of the attenuation functional model (please refer to <http://www.gmpe.org.uk/gmpereport2014.pdf>).

The authors validate the estimation of AM and of CB14 to the simulated GM: they find out that AM works better (which is obviously coming from the regression analysis using the same database) and conclude that CB14 ('imported GMM') deviates from the simulated GM.

The authors do not justify the choice of CB14 model to compare their work in this region, considering that CB14 do not take directivity into account.

Please show: Gilboa and Carmel faults in figure 1.

L97: the DSF magnitude potential of up to Mw7.5 (Hamiel et al., 2009).

L 99- 101: the information are not fully coherent with Nof. et al 2021 (TRUAA—Earthquake Early Warning System for Israel: Implementation and Current Status)

Better use the official name of the TRUAA project (instead of Tru'a)

L 129: I would recommend the author to dedicate a few lines to better describe the spatial heterogeneity of the Earth structure.

L135: please add reference

L189: I would recommend a few lines to describe the software, the (dynamic ?) simulations, how does it consider the source, propagation and site effects, the assumptions made, the choice of the nucleation point

L 234-236: the authors choose rupture speed to be equal to 0.9Vs and 1Vs for subshear and supershear scenarios respectively. please justify this, knowing that the rupture speed should be lesser than 0.85Vs or larger than 1.2Vs.

L252: why 129 GM simulations seem sufficient ?

L 352: Can the authors explain why the duration of the simulated GM is not function of the distance?

L 399: please explicitly show how you notice this conclusion from the AM. do you notice the same conclusion with your simulated ground motion ?

L 415-416: you can not study the variability of the ground motion with a model that is not validated.

L434: this statement is not a result of your work and thus should not be described in the summary section.

figure 1:

- better resolution ?
- b. please define PA in the caption.
- b. I would recommend the authors to change the description: 'the Israel seismic network in Israel: yellow.. and brown .. . the green circles show the population ..'

figure 2:

plot Y in logarithmic scale ?

figure 3:

- show the location of the vs profile on plot (a)
- what is the reference of this plot
- what do the yellow and purple colors represent ?

figure 5, 6, 10:

use the same color legend for M6 and M7

figure 10: remove `comparison` from the caption description.