

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC2
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Comment on nhess-2021-393

Stéphane Baize (Referee)

Referee comment on "Classifying marine faults for hazard assessment offshore Israel: a new approach based on fault size and vertical displacement" by May Laor and Zohar Gvirtzman, Nat. Hazards Earth Syst. Sci. Discuss.,
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The paper presents a large compilation and analysis of high-quality bathymetric and seismic-reflection data, with the aim of providing classification and mapping of subsea faults that are potentially hazardous for installations. The region of concern is vast (120 x 40 km²) and corresponds to part of the margin of the eastern Mediterranean basin, off Israel. This margin is subjected to significant deformations of the most superficial layers (0 to 1-2 km) of Plio-Quaternary age. These deformations are largely due to the mobility of this sedimentary cover on the salt layer dating from the Messinian, amplified by the slope of the margin.

The paper fits the objective of the journal, presents relevant products for further hazard analyses (surface displacement maps, deterministic hazard map) and then deserves to be published. However, I think there must be major revisions, including formal improvements, additional analysis, and moderation in some interpretation.

The major criticisms are as follows.

- Some figures are too small and labels and captions are barely visible.
- The authors should develop the data and methods section and provide more information on data availability and processing options (mainly seismic reflection).
- The part of Section 2 concerning ancient (pre-tertiary) geology could be lightened, and the part concerning elongated Neogene. In addition, a paragraph is missing which links (or not) the structures observed with the tectonic faults known on land.

- Section 4 (Results) should be restructured to be consistent with the maps and figures produced. Some figures are barely commented and deepened, which is a shame.

- Section 5 (Discussion) needs to be improved. Most of the current content is a summary of previous sections, not a discussion.

- The interpretation of seabed scarps, as evidence of coseismic ruptures, is in my opinion doubtful, even erroneous, if one considers the context of the development of structures on the slope of the margin and the occurrence of salt-related deformations. To demonstrate a relationship with earthquakes, the authors must provide more observations.

- There is a lack of analysis of the maps and displacement profiles produced (Figure 3 in particular), especially when comparing seabed scarp heights and Unit 4 throws at key locations, and/or for each fault identified.

- It would be useful that the authors suggest ways of using the deterministic hazard map provided. Is this to be used to exclude any installation on «red» faults, or is it a decision tool for the engagement of further studies? Which of studies could be made to assess the hazard (probability of displacement)? What about the existing installations on “red”, “yellow”, “green” faults?

- Finally, an important point is to state on the availability of original data (bathymetry, seismic profiles), developed tools (algorithm) and results (numerical files of fault maps, seabed scarps, displacement measurement points, etc.).

The details of the comments are available in the attached pdf file.

Stéphane Baize

Please also note the supplement to this comment:

<https://nhess.copernicus.org/preprints/nhess-2021-393/nhess-2021-393-RC2-supplement.pdf>