

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC2
<https://doi.org/10.5194/nhess-2021-306-RC2>, 2022
© Author(s) 2022. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on nhess-2021-306

Luigi Ferranti (Referee)

Referee comment on "Geologic and geodetic constraints on the magnitude and frequency of earthquakes along Malawi's active faults: the Malawi Seismogenic Source Model (MSSM)" by Jack N. Williams et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-306-RC2>, 2022

The manuscript by Williams et al.: "Geologic and geodetic constraints on the seismic hazard of Malawi's active faults: The Malawi Seismogenic Source Database (MSSD)" represents a comprehensive contribution to parametrize seismogenic sources in this section of the EAR and helps assessing the resulting hazard.

The steps for building the database are clearly illustrated and uncertainties explored in details.

This database extends the previous database available only for the southern part of the rift (SMSSD) to the whole Malawi rift (south, central and north), and increases the estimates of source parameters by adopting an updated geodetic model which results in a useful reduction of parameters uncertainties. I find particularly interesting the comparison between system-based and geologic-based (the offset of a 75-ka seismic reflector in Lake Malawi) estimates of slip rate and recurrence, which offers confidence in adopting the system-based approach elsewhere (central and northern sectors) where geologic information is scarce. I also agree with the possibility of very large (>7.5 Mw) but infrequent extensional earthquakes in this strong and thus elastically thicker continental crust although the hazard is clearly posed by intermediate and more frequent earthquakes.

In summary, the presented compilation poses a strong basis for future detailed studies aiming at more detailed field and geophysical characterization of fault geometries and segmentation patterns and of estimations of aseismic release on some faults. I have no observations on the manuscript structure and arguments. Two typos are indicated below.

Line 138: invert "lower aseismic crust" with "aseismic lower crust"

Line 379: "and there a range", correct with "and there is a range"