

Response to RC2 (Dan Clark):

First of all, thanks for the review and the interesting questions that have been mentioned within the review. They definitively will inspire further studies and publications. However, at the moment, trying to answer them would be mostly speculation, because the MF is only the second fault in the Vienna Basin that has been investigated with paleoseismological methods. The other studied fault is a much smaller fault on the western margin of the Gaenserndorf terrace, where there was no clear exposure of the fault within the trench (Weissl et al., 2017). Even though there is information about the long-term Quaternary displacement along most of the faults from boreholes (Decker et al., 2005), detailed information about paleoseismic events along the faults is not (yet) available.

Paleoseismological investigations at the VBTF are, at the moment, not finished. Therefore, more work must be carried out before we can address these questions. Hence, we think addressing those questions is beyond the scope of this paper and the data presented here.

Probabilistic framework. This topic has been also brought up by RC1 (Ryan Gold). We were not aware that OxCal can also be used for IRSL dating results; we thought that it was mostly used for calibration of radiocarbon ages. Since all the time constraints for our trenches come from IRSL dating, we thought that OxCal was not applicable in this study. But following the suggestion of both reviewers, we managed to transfer our IRSL dating results into OxCal and obtained good results. However, the results are comparable to the results previously shown in the manuscript. We added the resultant occurrence intervals to table 3.

Linkage to the Vienna Basin Transfer Fault. We do think that the MF is connected to the VBTF via the common detachment, and we also mention it shortly that in the discussion about the possible activation of the detachment during an earthquake along the MF. However, there is no ready to be published paleoseismological data yet to link both faults. See also comment to RC1 and RC4.

General comments:

Labeling of the units. We followed your suggestion and labeled the colluvial units. In addition, due to the comments also provided by the other reviewers, we changed the figures for better understanding of the units and the position of the detailed figures in the trench logs.

Combination of age data between trenches. Due to the recalculation of the occurrence times in OxCal, we have rewritten the section and changed Figure 10 accordingly. See also respective comment to RC1. We did calculate the COV for each slip model and obtained higher COV for the clustered slip model than for the periodic slip model. However, we are hesitant to use it because of the small sample size. Most studies, where COV were applied to distinguish between periodic and aperiodic behavior, had at least 10, or even 25 earthquake occurrence times. In such cases, the COV are more meaningful than in the study here.

A larger area than only the MF by rupture of the VBTF and MF. You are right, a combined rupture would lead to a larger earthquake magnitude. And we also think that this a very important part to keep in mind. But since we focused in this paper on data for the MF and the impact of this fault to the seismic hazard, we thought that the scenario of a combined rupture of the VBTF and the MF might be beyond the scope of this manuscript. See also comment to RC1.

Periodic/aperiodic vs. characteristic/supercycle. Yes, you are right, we got confused here. The reason why we mentioned it here was because it seems that these faults also are quiet for a long time and then are switched on (maybe triggered by the VBTF). Hence the comparison to the characteristic/super-cycle. We changed the introduction in this sense. See also comment to RC1.

Creep. Prior to our study, the MF was suggested to creep aseismically. However, we did not find any evidence for creep in the trenches. See also comment below and comment to RC4.

The **lack of a geomorphic site sketch/map** has also been mentioned by the other reviewers. We included the relevant figure as well as the topographic profile and the landscape picture as suggested and added the names of the towns. See respective responses to RC1 and RC4.

Far field displacement. Separation of red horizon is due to the sedimentation on pre-existing topography. Besides this, the total topographic step is about 17 m (as visible in Figure 3), but in the trenches, there is no sign for afterslip or interseismic creep.

Threshold for surface rupture in this area and their discoverability. One of the largest earthquakes in the Vienna Basin, the Dobra Voda Earthquake of 1906 had a macroseismic magnitude of $M=5.7$ and epicentral intensities of $I_0=8-9$. From field surveys after this earthquake, discontinuous surface cracks in the order of 1-2 m depth are documented. Slip along those cracks was recorded to be between 50 and 100 cm. However, it is hard to tell from the available description whether those features were primary or secondary ruptures. Regarding the discoverability and preservation of such small single-event fault scarps: the Vienna Basin is an intensively agriculturated area. This together with strong erosion may hide single event scarps outside of forested areas.

Mmax as minimum Mmax. Yes, you are right. Of course, this is the Mmax that at least should be considered, based on the data presented here. If interaction between faults and rupture of several segments is considered, the Mmax for the Vienna Basin would be definitively increase. See also respective comment to RC1.

Figures: We went through the figures with the annotations in mind, removed all inconsistencies, added and explained labels, where missing, changed Figure 10 to add the OxCal results. We finally added the uninterpreted photomosaiques to the supplementary.