The authors deeply appreciate the constructive comments from the reviewer, and will incorporate the reviewer's suggestions in the revised manuscript once approved by the editor. Our point-by-point response to the reviewer's comments is given below:

*General referee comment: Seven soil samples were collected at 3 different sites in the River Idrijca catchment close to the old Idrija Hg-mine. The mercury flux from the soil samples as function of temperature, UV radiation and humidity was investigated using a laboratory flux chamber system. The aim of the present work was to study some characteristics of mercury flux from contaminated soil during simulated environmental conditions in the laboratory.*
*The measurement result is discussed in terms of chemical and physical processes promoting flux of elemental mercury from soil. The result is mostly of qualitative nature but gives some insight into the complicated nature of these processes. The paper merits publications after revision according to the comments made below.*

Response: We thank the reviewer's assessment of the value of our work. One major and the three minor comments raised by the reviewer are addressed in details as follows.

*Major comment: Regarding Figure 3, activation energies (Ea-values) are plotted as function of total mercury in soil samples. In the text it is explained that the mercury flux from the different soils are due to different chemical and physical processes. The question is how relevant it is to compare activation energies if the involved kinetics is of different kind. The conclusion made in the paper is that in contrast to earlier investigations an increase in activation energies with increasing mercury concentration in soil is observed. I think that this conclusion is wrong. Hence, when looking at the Ea-values corresponding to the samples I-1, I-2 and T-3 (which are said to be soils with high cinnabar content) a weak declining trend with concentration is actually seen. Activation values obtained from sample T-1 and T-3, corresponding to soil enriched with $Hg^{2+}$, yields a very strong declining trend with concentration. In other words, when considering these circumstances the conclusion is that the findings actually fit with earlier investigations.*

Response: This is a valuable comment and we agree with the reviewer in this regard. We believe that comparison of activation energies calculated for different soils is important as an indication of the importance of not only the amount but also the type of mercury species and their binding in soils. The different values found for the activation energy over different soils do not necessarily imply different mechanisms that control the release of mercury from the soil. In the revised manuscript, we will modify the text as well as Figure 3. The results will be discussed separately for samples relatively enriched with cinnabar and those enriched in non-cinnabar forms.

*Minor comment #1: First paragraph in chapter 3 on page 8 it is stated: "In general, similar trends were observed for all samples under investigation. The strong influence of all three parameters investigated, namely soil surface temperature, radiation and soil moisture, on the momentum MEF was observed"*
*However this is not true regarding influence on soil surface temperature for the R-1 and R-2 samples. Also in the rest of the manuscript the results from these samples are not much commented. Maybe the reason for this should be explained.*

Response: We agree with the reviewer and will modify the text to avoid the confusion in the revised manuscript. Regarding the influence of soil surface temperature, the R-1 and R-2 samples behaves differently with other samples due to very low initial soil moisture. As discussed in section 3.3, soil aqueous phase seems to be responsible for recharging the

pool of mercury in the soil available for both the light- and thermally-induced flux. Due to the clarity, we will incorporate this information in section 3.1 of the revised manuscript.

*Minor comment #2: The statements in 3.2 on page 11 beginning with "Moreover, after simulated precipitation, MEFs remained up to 22% higher ....." and so forth is quite difficult to understand.*

Response: The statements will be reviewed and improved.

*Minor comment #3: Second paragraph in 3.3, page 12. It is stated: "After defrosting when the samples reached room temperature, soil water started to percolate through the soil column". But in 2.2.2 it is said that the experiments were initiated by cooling the soil samples to about 2˚C.*

Response: As written in the sample processing section (2.2.2), in the beginning of the experiments, samples were cooled down to - 2˚C.