EGUsphere, referee comment RC2
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Comment on egusphere-2022-668

Anonymous Referee #2

Referee comment on "The Münsterdorf sinkhole cluster: void origin and mechanical failure" by Georg Kaufmann et al., EGUsphere,
https://doi.org/10.5194/egusphere-2022-668-RC2, 2022

The paper deals with an interesting aspect of the application of geophysical investigations and modelling for the understanding of genesis and the exploration of sinkholes of the locality Münsterdorf. The focus is on the use of results from direct push soundings and geophysical explorations for the numerical modelling of the formation of sinkholes. The publication of the paper is supported in any case, but some minor but substantial changes or additions are required:

Previous geophysical measurements

Various assumptions about the geological structure of the subsurface come from earlier geophysical investigations, which unfortunately only briefly described. A table with the measurements carried out so far with reference to literature should be added.

Forward Modeling

From the reviewer's point of view, two overly simplified model calculations for the detectability of cavities by means of gravimetry and geoelectrics are presented. In addition, the rock physical parameters used must be checked for consistency in the paper. For example, some of the resistivities used for modeling do not match the values given in

Table 1. Furthermore, the effect of the described glazial till layers was not taken into account, although these influence the density distribution and resistivity distribution in the subsurface.

This section should be supplemented by geophysical measurement examples for gravimetry and geoelectrics from the investigation area. If this is not possible, the section can also be omitted.

Drop of the groundwater level as an initial event

The drop of the groundwater surface causes the formation of earth falls. The hypothesis is explained in detail and comprehensibly. However, there is a lack of information on the past and present location of the groundwater surface as well as on the course of the groundwater surface between the study area and the opencast mine. In Figure 11, information on the location and topographical height of the stör river and the opencast mine as well as the distance between the objects must be supplemented to scale. Is a lowering of the groundwater level by several meters away from the opencast mine really realistic and what role does the mentioned fault zone on which the sinkholes are located play?