

**Reply to the editorial comments to the revised version of *essd-2020-139* “Petrophysical and mechanical rock property database of the Los Humeros and Acochulco geothermal fields (Mexico)” by Leandra M. Weydt et al.**

Dear Dr. Kirsten Elger,

Thank you very much for processing our manuscript and your detailed proofreading. Please find below our answers to your comments and the modifications carried out in the manuscript.

**1) Comment to available Excel files stored in the TUDatalib data repository**

Answer: As described in the manuscript, we provide our database in two formats: 1) standard Excel file (.xlsx) and 2) as .csv – files. The standard Excel file comprises two spreadsheets (or datasheet): the first one includes all metadata and rock properties and the second one includes all geochemical data. Therefore, we are referring to the “first” or “second datasheet of the database” in the manuscript. The .csv files are needed for users that want to access the data directly via software or other program languages. Thus, each spreadsheet of the database needs to be stored separately as .csv file. Hence, three Excel data tables should be available for the user.

Unfortunately, we recognized that during the update of the database on 11<sup>th</sup> of November, the wrong Excel file (.xlsx) has been uploaded. We now uploaded the correct Excel file and requested to delete the wrong version to our TUDatalib platform service team. The data repository should now include three Excel data tables as described above. We hope this clarifies the confusion.

Since the database comprises more than 140000 entries, we think it is not possible to integrate the spreadsheet into the manuscript or add it as an appendix in form of a pdf-file. Therefore, we like to keep referring to it as a DOI-link, which is already integrated in the abstract, introduction, data availability, and references as requested by the journal at the beginning of the review process.

**2) Comments to further specify the applied methods in the manuscript**

Answer: We agree that providing as much detail as possible of the applied methods is beneficial for the user and increases the reproducibility of this study. However, the measurements conducted in this study were carried out according to internationally recognized testing methods, which are described in detail in the different standards and are developed and verified by numerous norming institutions and committees like the International Society for Rock Mechanics and Rock Engineering (ISRM), American Society for Testing and Materials (ASTM International) or other national standards (e.g. DIN). The methods have been applied worldwide in the past 40-50 years and longer. Therefore, we prefer to keep the manuscript as concise as possible and would like to add only short comments to the respective sections. It is not our aim and not the focus of this study to justify standard methods or to argue which of the applied methods is more suitable. Such a review could easily fill another paper and we would prefer to not distract the reader by adding a half to one-page summary/discussion to the manuscript.

We added the following comments to the revised manuscript:

- Microcracking – p. 12 line 349:

“Microcracking or significant mass losses caused by mineralogical changes or the collapse of clay minerals during heating in the oven were not observed since the majority of the outcrop samples contain no clays and samples affected by hydrothermal or metamorphic processes contain mineral assemblages developed at higher temperatures.”

- Differences between porosity measurement methods – p. 12 line 373:

“Variations in particle and bulk density between the different methods applied on the same samples range between 0.3-3% (coefficient of variation) for limestones with porosities smaller than 3 % and 0.5-3.5% for pyroclastic rocks with porosities between 11 and 15%, verifying the different methods and sample saturation procedures as sufficient to obtain data with the needed accuracy.”

- Forchheimer correction – p. 12 line 388:

“The recorded flow rates were tested for turbulent fluid flow according to Kushnir et al. (2018) prior to the Klinkenberg correction to ensure laminar fluid flow. A correction after Forchheimer (1901) was not required, since the corrected values were within the error range of the measurement device.”

- Provide more information on how the saturated velocities were measured – p. 14 line 432:

“For analyzing the samples at saturated conditions, the samples were stored in degassed and de-ionized water to avoid desaturation. After preparing the device and measurement set-up, the samples were immediately installed between the transducers, and the transmitted signals were recorded until the sample starts to desaturate.”

### **3) Comment on the usability of the database**

Answer: Thank very much for this comment. In our opinion, the suitability of this database has already been extensively described for general applications independently of the study area in the discussion. Thus, both caldera systems only served as case studies for super-hot unconventional geothermal systems in general as described in the abstract, introduction and project outline. This study aims to provide detailed raw data for various applications with respect to such systems (e.g. feeding calculations for reservoir assessment and 3D geological models with raw data) and to improve the understanding of the relationships between different rock properties and how they are affected by diagenetic or hydrothermal processes, which occur in these geological settings.

As written in the manuscript, the data could be used for comparable geological settings within the TMVB or similar play types worldwide. The TMVB is a quite large and relatively unexplored area when it comes to geothermal exploitation (three of the biggest geothermal reservoirs in Mexico are located there) and there is a big interest to built further power plants. The first example would be Aocolculco, which is still a greenfield, but a potential candidate for the development of a geothermal reservoir.

The data from Los Humeros and Las Minas could be used, and already have been used within the GEMex project, for first reservoir assessments and modelling approaches. Furthermore, the carbonatic sequences in the study area and in the TMVB are still an important target for the oil and gas industry and the ore bodies in Las Minas are one of the biggest and most important mines in the country. Regarding other study areas beyond the TMVB, the data can certainly be used for a first assessment in the oil and gas, mining or geothermal industry. The 'suitability' of the data strongly depends on the purpose, the scale (from global to local) and area/geological context of future projects. The detailed sample description, available metadata and geochemical data allows the user to check whether this data meets the requirements of their project or not. Thus, we prefer not to extend the discussion by another section – also with respect to the meanwhile overwhelming length of the manuscript – or to restrict our data to a specific site.

#### **4) Comments to references and DOI's**

Answer: Thank you very much for this hint. All DOIs were added and updated and all links were activated to increase the accessibility for the reader.