

General comments

I think this dataset is well worth publishing. It is relevant to society in general and a multitude of geological questions that can only be answered with such a unified model. The dataset represents a big step forward, as up to now, only small regional projects have been realised, or large-scale global models, but not with this scale of detail.

I have general comment about which model unit is included when models clash. In Line 110, onwards, – “the order of projection is determined according to various criteria, e.g. year of publication, model resolution, etc.” This very vague statement seems to suggest the newest datasets are the best. I guess you must have decided on which stratigraphic layers were better for your end model using other criteria (a kind of triage!). Please expand this section. I realise you cannot discuss every nook and cranny of the model, but give some examples and give the rationale for your decision.

The weak point about this manuscript is the English language. Besides numerous typos and grammatical points, there are numerous errors concerning adverbs, verb use and use of the passive voice that obliterates from knowing whether the authors or other authors actually carried out the work. The use of capital letters, for instance for stratigraphic units, etc. needs to be revised and made uniform. Commas and hyphens are missing throughout the text. They would make the paper so much easier to read. Conversely, some commas are superfluous. The text should be checked by a native English speaker. Don't use an apostrophe in “id's” -> ids (for instance in Figure 4 caption)

Thank you very much for your helpful comments, suggestions, and corrections. They have helped us improve the manuscript. We have either incorporated your specific comments or provided comments.

You are right that the criterion “year of publication” is not precise enough to be generalized, even if it might be applicable in the German part of the Molasse Basin. We have replaced the term with “year of model creation” and have added a discussion of the “order of projection” (lines 258–290).

Additionally, we have proofread the entire manuscript for typos and grammatical errors. We have reduced the use of the passive voice, making it clear who performed the work. We have also restructured numerous sentences to improve readability and revised the use of capital letters.

Specific comments

Title

I think the title is too short. What about “A combined geological model of Germany and adjacent areas”. At least “for” should be replaced by “of”.

Thank you for your suggestion. We have changed it to „A unified 3D geological model of Germany and adjacent areas“

Abstract

Line 11: We present a new Germany –wide 3D geological model -> We present such a 3D geological model

We have rephrased the previous sentence. From our point of view, it now makes sense to mention these points again.

Line 13: change states -> countries

Line 15: was chosen which -> was chosen, which

Line 15: with regard to the flexibility -> with regards to its flexibility

Line 16: Write out “FE model” -> Finite-element model

Introduction

Line 19: “lithostratigraphic” is too loose a term. These are all geological units, some which are lithostratigraphic, some are only model-based, e.g. the Moho.

We have changed it to „geological units“

Line 24: “and how these conditions are potentially be disturbed by subsurface operations” -> and how these conditions would be potentially disturbed by subsurface operations

We have rephrased the sentence to „as well as how subsurface operations would potentially disturb them.“

Line 33: You give the abbreviations of the different models without introducing them to the reader. Either don’t list the projects, just give the references, or write the acronyms out here.

We have replaced MOLA and CEBS. However, TUNB, GeoMol and GeORG are the official model/project names.

Line 36: delete “currently available”

Line 43: finite element -> finite-element

Line 48: size -> sizes

Database

Line 57: one model -> one single model,

Line 60: rephrase this sentence. “have been created” especially doesn’t make sense.

Line 64: German-wide -> Germany-wide

Line 96: Rephrase “we use point sets which are projected onto input data.” I don’t understand exactly what you mean here.

We have rewritten the sentence: „Instead of creating triangulated surfaces, we use a point set approach.“

Line 119: “region models” – regional models

Line 142: delete “again”

Line 183: This sentence is passive. Please use the active, ie. “We chose a region....”

Line 185: “coordinates”

Line 189: “crystalline crust”

Line 199: “which have to be updated with respect” – There must be a better way to write this. I suspect modified and saved.

We have removed the whole sentence.

Figure 6: Can you please add some cultural information as an overlay? E.g. Rivers, political boundaries, etc.

We have added political boundaries, coastlines and country names.

Line 241. “A major advantage is that the point sets can be directly used for the fast creation of discretized models with ApplePY ... as shown in Sect. 3.4 and no specific software is necessary for use.”

-> A major advantage is that the point sets can be directly used to create discretized models with ApplePY ... , as shown in Sect. 3.4. There is no need to use (other) specific software.”

Line 245: in to one model.

Line 246: has some limitations, e.g.

Line 262: 3DD?

This is the name of the model of Anikiev et al., (2019). We have added a reference.

Line 263: was extended using – using what? If you mean the citations, bring the names out of the brackets.

We have removed the brackets.

Line 266: found in fragments -> found as fragments

Line 274: Why not name all Germany’s neighbouring countries? There are not that many.

We have added the missing countries.