

Earth Syst. Sci. Data Discuss., author comment AC1
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Comment on **essd-2020-375**

Pavol Zahorec et al.

Author comment on "The first pan-Alpine surface-gravity database, a modern compilation that crosses frontiers" by Pavol Zahorec et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2020-375-AC1>, 2021

Dear Christian Voigt, dear Roland Pail, dear Anonymous,

First, we would like to thank you for the time invested in reviewing our (long) manuscript. We are pleased that the assessment of the content and the significance for the geo community is positive, also documented by a very positive public comment by Leni Scheck-Wenderoth. After intensive internal discussion will largely follow the suggestions of the topical editor.

With respect to the comments by the reviewers:

Roland Pail has acknowledged in his review the work done by the international AAGRG over the last years and we believe that he has fully accepted our intention in writing the manuscript - we appreciate his review very much.

Regarding the anonymous review, we would like to address some aspects of his review in more detail. ESSD expects a precise and comprehensive, even detailed description of the data sets provided. The presented dataset is the result of national data collection of the Alpine countries for almost 100 years applying different techniques of data acquisition and processing. Therefore, detailed explanation as provide by us is very much needed and we disagree with the suggestion to publish the manuscript as a report at one of the participating institutions. The technical description is novel and very much need to comprehend the details of the data sets. If the interest is only in applying the data on a regional scale, such details might not be needed, but for applications interested in the details of the data sets, that is critical information.

We strongly disagree that our work does not contain "something new and/or innovative topics" and with the recommendation that "the historical data details" should be condensed as they contain important meta-information that was/is indispensable for the overall data processing. We have asked ourselves why "reference systems", DEMs, explanations of mass correction and **validation** should be superfluous. We consider the evaluation of the "uncertainty" of the new CBA data as an important point.

As the editor agrees on, the presented manuscript will surely attract a wide and diverse readership, already now downloads of the preview on ESSD are numerous with about 500

accesses.

While we do not consider that the length of a paper should be subject for criticism, if the content requires such details, we will put substantial chapters (e.g. history with contributions of individual countries, metadata description, list of abbreviations and some short technical chapter parts) in an appendix to increase appeal to the reader. Whether we will reach the proposed number of pages of 15 - 20 remains to be seen, because we think that the numerous performed processing steps must be clearly preserved in the description.

Concerning the actuality and novelty of the data compilation we carried out, we would like to reply to the opinion of the reviewer 2 that this compilation would not result in anything new. On the contrary, thousands of unpublished (e.g., industry) data have been included in the compilation due to the contracts we have signed with the participating countries. These data may neither be shown as point data, nor described as such. By agreement we can publish the new database "only" on a 4 km x 4 km grid and give the 2 km x 2 km grid exclusively to members of the AlpArray consortium only after of the participating institutions.

This is also the significant difference to the noteworthy work of Heiner Denker, whose work for the IAG we will mention in our manuscript - thanks for this hint. The database described and published here is unique in this respect also justifies the designations "**first...** Bouguer gravity database" etc. Furthermore, we would like to mention that neither an improvement of the quasigeoid nor of the geoid in the difficult high mountains of the Alps was in our focus. Our aim is to provide a valuable contribution for the numerous interdisciplinary projects in the AlpArray initiative and other European geo projects (see also comment by Prof. Scheck-Wenderoth) that supports lithosphere and mantle modelling in the Alpine-Mediterranean region.

We are already working on a revision of the manuscript along the lines of Christian Voigt's summary and hope that this urgently needed new database can be published soon.