

Earth Syst. Sci. Data Discuss., community comment CC1
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Comment on [essd-2020-375](https://doi.org/10.5194/essd-2020-375)

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Community 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-CC1>, 2021

I would like to emphasize that this is an extremely valuable contribution for which a lot of scientists have been waiting for ages.

This is not a paper on gravity data acquisition, geodesy or the geoid, but a paper offering a base for future multidisciplinary earth science research. The presented database is intended as the authors say to support integrated analysis linking structural geology, tectonics, mineralogy, geomorphology, seismic and electric methods.

Clearly gravity data are the observations that help to integrate a lot of other informations in 3 dimensions. Those who have tried to link the information of 2D deep seismic lines and other shallow 1D/2D observations into a physics based 3D representation of physical properties on the scale of the crust know about what I speak here. It always was a major barrier that data was not publicly available, not documented properly and restricted to domains limited by political boundaries. This piece of work presented here is the outcome of a gigantic joint effort that paves the way for the next generation of geodynamic understanding.

I do not agree with the posted comments that there is nothing new in the paper. The data is new and has never been presented before. Not only do these data resolve regional patterns at an unprecedented accuracy, they also will allow to resolve crustal density distributions in the future and thus understand GPE, stress and structure at the scale of the orogen.

Previous gravity maps of the region either did not "see" certain wavelengths or were not public or did not come with a proper documentation on how ground-based, plane-based and satellite data have been married.

I therefore congratulate the team of authors to have kept the faith in this endeavour of integrating cross-country-cross method and to have provided a proper documentation of how the data has been treated. Yes the paper presents a long, honest and detailed description of these treatments including related uncertainties, but I consider this a strength of the manuscript. These integration methods are scientific achievements on their own, but the real added value for the community lies in the data. Finally it is possible to evaluate in great detail density heterogeneities at the full crustal level, not to speak of the

many other options of analysis, such as assessment of different gravity gradients and their relationship to structural elements.

For the above reasons I look forward that these data will be published and thus be made available as fast as possible.