

Interactive comment on “Gravity modeling of the Alpine lithosphere affected by magmatism based on seismic tomography” by Davide Tadiello and Carla Braitenberg

Anonymous Referee #2

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Dear Editor, Dear Authors,

the manuscript entitled "Gravity modelling of the Alpine lithosphere affected by magmatism based on seismic tomography" provides a very interesting and promising approach to model the density distribution in the Alpine crust. It makes a lot of sense to use existing seismic models as starting point to determine the density structure as they deliver reasonable constraints on Moho depth and principal crustal structures. However, I would like to see a more thorough discussion on the influence of the chosen starting model and of the 1D reference density model on the final result. This doubt is related to the observation that the Bouguer gravity anomaly (Fig. 3c) and the

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gravity anomalies after correction with the model obtained from seismic data (Fig. 7b) have a similar absolute range of values. Would your inversion results be drastically different if you simply used the 1D density model as starting model instead of the more complex Vs model? Many of the other comments listed below are related to the clarity of the manuscript, I would recommend a thorough revision to improve the English of the manuscript. Many local names of faults and regions in northern Italy are used in the manuscript. It would certainly be easier for the reader if these regions were marked somewhere in the maps. The manuscript is well structured and the methods are properly explained. I would recommend the manuscript for publication in SE after a major revision that addresses the points listed in the supplement.

Please also note the supplement to this comment:

<https://se.copernicus.org/preprints/se-2020-101/se-2020-101-RC2-supplement.pdf>

Interactive comment on Solid Earth Discuss., <https://doi.org/10.5194/se-2020-101>, 2020.

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