

Solid Earth Discuss., referee comment RC2
<https://doi.org/10.5194/se-2021-90-RC2>, 2021
© Author(s) 2021. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on se-2021-90

Carla Braitenberg (Referee)

Referee comment on "Sedimentary basins of the eastern Asia Arctic zone: new details on their structure revealed by decompensative gravity anomalies" by Roman V. Sidorov et al., Solid Earth Discuss., <https://doi.org/10.5194/se-2021-90-RC2>, 2021

The research has the goal to revise the sediment cover thickness and density in a remote region of North Eastern Asia, covering both continental and oceanic areas. Depending on a starting model, the gravity field and isostatic considerations are used to define residual gravity anomalies which are used to correct the sediment thickness model. The topic of study is of general interest, and the authors are experts in the analysis of the gravity signal. There are a few general points that should be stated more clearly, as the fact that all residual anomalies are interpreted in terms of the sediment cover, whereas positive density anomalies in the crust, which could affect also the superficial layers are not considered. Another point is data availability- it would be important that the data are effectively available at the time of publication. The present sentence does not allow the reader to access the data, so please make the data files available together with the revised text.

Further issues are listed below.

The text is written clearly and in good English. I suggest the manuscript can be accepted pending minor revision.

Minor remarks:

p.3, L. 79 ...and then deformed during a collision between the East Siberian and East Arctic continental lithospheric plates

-> ...and then deformed during the collision between the East Siberian and East Arctic continental lithospheric plates

L. 89 - North of the territory is bounded by the Arctic Ocean Shelf of the Laptev Sea, East Siberian Sea, and Chukchi Sea. -> check grammar. You mean: The northern part of the territory....?

P. 6, L. 184- please check reference calls according to SE instructions.

L. 186: M is the depth to the Moho-> M is a single value, whereas Moho depth varies over the window in which the spectral analysis is calculated; define if it is a reference value an average depth, and criterion to define the value.

L. 199-200: The isostatic correction is estimated in a sliding window as a convolution of

the

200 adjusted topography with the Green's functions for corresponding M and EET -> please explain in the methodological part how the Moho depth M and elastic thickness EET are set, as needed in the equation 4 and 5.

P. 7, L. 223: For computation of the Bouguer anomalies-> Which maximal radius was used for the effect of topography/bathymetry? Which method to discretize the topography was used? Was the global topography correction used? If not, justify.

P. 8, L. 253: The residual isostatic anomalies are displayed in Fig. 5b-> add for clarity that these are isostatic anomalies corrected for the effect of a starting model of sediments

P. 9, L. 258: Based on computed decompensative gravity anomalies: we have corrected the initial model of the sedimentary cover-> You explain the final anomalies through a correction to sediments thickness and density- but the anomalies could also be due to local densification of the crust, as magmatic intrusions or magmatic deposits, or metamorphic processes. Please explain in the text that the possible densification is not considered, and what uncertainties on the crustal structure may arise. Another question which arises, is whether in the inversion process you control where sediments are present, and how you deal in areas where no sediments are documented.

Data Availability: please make all the data available at the time of revision of the manuscript and specifically indicate the link, according to journal regulations.

Figure 9a: color scale lacks numbers.