Comments by review
"Title: Sedimentary basins of the Eastern Asia Arctic zone: new details on their structure revealed by decompensative gravity anomalies"

A- GENERAL COMMENTS

- The study area of the manuscript is a large area located in the Eastern Asia Arctic zone where it is the inaccessibility territory, rigorous climate and low habitability and geological and geophysical exploration activities are very poor. The author's manuscript based on the well-known interpretation method of decomposition gravity anomaly has been successfully applied in determining the structure of basins in some areas of the world, for example, in the Rio Grande Rift (Cordell et al., 1991), in Antarctica (Haeger and Kaban 2019), in Congo basin (Kaban et al., 2021a), in the Southern Part of the East-European Platform (Kaban et al., 2021b). I believe that authors did a good job in using the decomposition gravity anomaly data to interpret the structures of basins in the Northeastern part of Asia. From calculating decomposition gravity anomalies and analyzing them, the authors have given a more detailed picture of the sedimentary thickness, density and new depocenter position of some basins in the study area. Although the analytical results obtained are more qualitative than quantitative, I highly appreciate the new contributions of the authors on the results of the determination of decomposition gravity anomalies, structures, shapes, thickness and density distribution of the basins in the northeastern part of the Asian where geological and geophysical exploration works are still very sketchy.

However, one of the biggest limitations of the paper is that the research area is very large, the scale of the map showing the results is too small, so the obtained results compared with previous results, as well as the comments of the authors are difficult to follow. I recommend the authors consider zooming in on the necessary figures and providing affirmative independent evidence for your new results.

- The authors use the methods mentioned in Haeger and Kaban, 2019; Kaban et al., 2021a, b, Kaban et al., 2016 for their calculations. However, the presentation of the method in this manuscript lacks creativity and could be unclear for the readers (the papers themselves by Haeger and Kaban, 2019; Kaban et al., 2021a, b, Kaban et al., 2016 are also very succinct). The presentation of the method for correcting the initial model in the "5-New models of the sedimentary thickness and

density" section should be moved to section "3-Methods" and presented more clearly verifiable.

B- SPECIFIC COMMENTS

- Line 219: Is it possible to change " Intermountane depression" for "Intermontane depression"
- Line 184: "the isostatic correction is estimated following (Kaban et al., 2016, 2017) as" You should be considered change "following (Kaban et al., 2016, 2017) as" by "the following (Kaban et al., 2016, 2017):".
- Line 185: What is G_{is} (kx, ky)?
- Line 190: "where ρ_s and t_s are the thickness and vertically averaged density". You should be considered change "where ρ_s and t_s are" for "where t_s and ρ_s are".
- Line 197: What do you use a Green's function for? Is it possible to change "We use a Green's function method (Wienecke et al., 2007; Braitenberg et al., 2002; Dill et al., 2015)" for "We use a Green's function method for calculation of Eq. (1) (Wienecke et al., 2007; Braitenberg et al., 2002; Dill et al., 2015)"
- Line 202 (in formula (4)): What is $G_{is}(x,y,M,Te)$?
- Line 266: "the range 1.9-2.72 g/cm^3" could be possible " the range 1.9 – 1.75 g/cm^3"?.
- Line 282: "5. Discussion" should be changed by "6. Discussion"
- Line 283: "5.1 Sedimentary cover: model 1" should be replaced by "6.1 Sedimentary cover: model 1"; and
- Line 377: "5.2 Sedimentary cover: model 2" should be changed by "6.2 Sedimentary cover: model 2"
- Maps in Figures. 8a, b, and 9 have a very small scale, so it is very difficult to follow the descriptions in the text, especially the detailed descriptions in some basins. For example, the Zyryanka basin is divided into 3 parts consisting of Zyryanka depression structures, Myatis zone, and Zyryanka-Silyapsk zone, or very detailed descriptions of its structural units (according to Koporulin (1979)), however, Figures 8a, b, 9 can't show these descriptions, so I recommend that the authors zoom in the maps in Fig 8 and 9 or some basins for readable.
- The location of the Avyon segment (or Avyon basin) in the Chauna basin is not shown in the figures.

- "In the continental part, the maximal thickness is shifted to the southeast less than in the first model, but in both cases its position differs from that one in the initial model".

Do you mean "The maximal thickness in the second model is shifted to the southeast less than in the first model, but in both cases its position differs from that one in the initial model"?

- The color ruler in Figure 9a lacks a density value.

- Line 429 (5. Conclusion): "For the offshore part of the Chauna basin (referred as the Ayon basin), the sedimentary thickness has appeared to be 2-2.5 km in the new model, which is lower than in the initial model (4 km). The new result agrees with the marine seismic surveys, which confirms robustness of the method".

In the text, you didn't mention the seismic data before. How can say your result agrees with the seismic survey? A short statement should be made on the comparison between your calculation and seismic data in the text

- List of references missing articles:

     Hildenbrand et al., 1996; (line 66)

     Zinchenko et al., 1987 (line 125)

     Drachev et al., 2011 (line 130)

- List of redundant references:

     Smelror, M.: Crustal structure and tectonic model of the Arctic region, Earth Sci. Rev., 2016. Vol. 154. P. 29-71.