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In the manuscript “Magmatic underplating with Proterozoic basin formation: insights from gravity study over the southern margin of Bundelkhand craton, India”, the authors investigate the tectonic mechanisms leading to the formation of two basins: the Bijawar and Vindhyan basins, located in proximity of the southern boundary of the Bundelkhand craton.
The authors suggest an extensional mechanism favored by magmatic underplating below the crust at relatively shallow depth (ca. 30 km), based on the analysis and modeling of global gravity data, and Bouguer gravity anomaly in particular.
The scientific question concerning the origin of the basins is relevant and of interest for the scientific community, and this is well explained in the manuscript Introduction. In general, the chosen methods are suitable for the proposed investigation and the manuscript is well written.

However, I think that some methodological choices require better clarification and support, to strengthen the results interpretation. Also, the quality of some of the figures requires improvement.

Here I provide some important points, which I believe should be addressed prior to considering the manuscript for final publication:

1) The authors use global gravity data and upward continue Bouguer gravity anomaly to investigate the crustal structure within the study area. I understand that upward continuing acts as a low pass filter to enhance the long-wavelength regional Bouguer anomaly trend.

   Please, can the authors explain why they chose 30 km elevation for the upward continuation? Is 30 km the elevation at which the effect of surface structures become negligible?

   It would be interesting to provide a few test examples of upward continuation at different elevations (possibly as supplementary material); also, see e.g. Zeng et al. (2007), *Geophysics*, for approaches to estimate ideal elevation for upward continuation.

   Also, the terrain correction seems to be small (less than 1 mGal), but topography ranges from 175 m to 617 m (line 152). Can the authors provide a topographic map of the study area, together with the grid points from the global gravity data they used?

2) The authors extract the regional Bouguer anomaly trend and separate it from the gravity effect of surface geological structures (residuals). However, they often refer to “Bouguer gravity anomaly” throughout the manuscript.
   Please, state explicitly which type of gravity data product is used for RAPS analysis, 3D Moho depth inversion, and 2D forward gravity modeling respectively.

   Is the upward-continued regional Bouguer trend used in every analysis? If yes, can it constrain the shallower (hence smaller wavelength) structures in the 2D forward

modeling (e.g. basin structures at a few km depth below the surface in Figures 6 and 7)?

3) Could the authors spend a few more words on the RAPS technique? The output provides a deep density contrast interface at ca. 30.3 km depth. What is the resolution expected from this technique, which, if I understand well, provides a 1D average information across the study area?

4) The authors perform a 3D inversion for the Moho topography. The algorithm they use requires assuming a mean depth z_0 and a density contrast. Why did they use 36 km for z_0? And not e.g. 30 km as obtained from the previous RAPS analysis?

   And related to this, how do these results change as a function of z_0 and density contrast? Please, provide a sensitivity test for these parameters, and a resolution test for the inversion algorithm application.

5) I believe a few important points should be clarified in the 2D modeling stage.
   The authors perform 2D forward modeling based on the formulas by Talwani et al. (1959). These formulas are best suited when both the data, and the target area, present a 2.5D symmetry (e.g. changing properties along the x-z plane, and no changes along y-axis); see e.g. Scarponi et al. (2021), *Frontiers* for one example.
   In particular, profile AA' seems not to be perpendicular to visible 2.5D structures, nor in the gravity data or in the underlying, inverted Moho structure (based on Figure 2 and Figure 5a). A slight-to-moderate rotation of profile AA' around its center (e.g. +-20 degrees) could potentially provide a different gravity data profile, and hence lead to different results and interpretation.

   a) The authors could consider using a 3D inversion software (see e.g. IGMAS+ in Spooner et al. 2019, *Solid Earth*). If not 3D, how would the 2D gravity profiles (data and models) look like along a set of parallel profiles (e.g. at constant longitude)? Would the results, and hence interpretation, change along a different profile than AA'? This should be tested and discussed before interpretation.

   b) Paragraph 3.5 on the construction of the 2D profiles never mentions incorporating the results from the 3D Moho depth inversion. Were these Moho results neglected in the creation of the 2D models shown in Figure 6 and 7? If yes, why?
   The authors mention the RAPS estimate as reference used in the profiles, but RAPS provides an inherently 1D average information. Moreover, profile BB' shows no interfaces around 30 km: please, can the authors explain the reason for this?

   According to Figure 5a, the computed Moho depths obtained along BB' range from 44 km to 34 km depth, but this seems not to be the case when looking at Figure 7. This should be clarified (partially applies also to profile AA' and Figure 6).

   c) In the definition of the structures within profiles AA' and BB', the authors refer to a list of previous investigations, to be used as external constraints. This is OK in principle. However, these external constraints are not explicitly indicated in Figure 6 and 7.

Which geometries were imported as unmodified external information? Which ones were generated and/or modified by the authors? This information is not clear and should be made explicit. The authors could also show in Figures 6 and 7, how their new Moho estimate compares to the external information they refer to.

Clarifying the points above is important to discuss the fit to the gravity data along the selected profiles. For example, was the geometry of the underplating structure in Figure 7 imported from external sources? How would the forward modeling compare to the data, with a different, or without, the underplating layer along AA'?

To address these points, I would advise starting by: 1) apply RAPS; 2) use the RAPS deepest interface estimate as z0 for the Moho inversion (provide sensitivity and resolution tests); 3) use the obtained Moho depth as starting geometrical constraint, together with those existing in the literature, either for 3D modeling, or for a set of 2D profiles (as much as possible along structures with 2.5D symmetry), providing support for the chosen 2D profiles; 4) test if the deeper underplating layers can be resolved by gravity along the chosen profiles.

Here I provide few additional specific comments:

- Figure 1b is not readable and should be larger. Figure 1a is readable, but please consider using different colors to highlight the different geological units.
  The perimeter box of figure 1a should appear in figure 1b to show its location;

- Figure 5 should at least contain a residual map (synthetics minus observations).
  It would be also beneficial to add a plot for RMS versus iteration number, to show the RMS reduction during the inversion, and a sensitivity and resolution tests (possibly in a different Figure);

- Figure 6 and 7 should show explicitly which geometries were imported as unmodified external constraints for the construction of the models. They should also show the Moho depth as obtained from the 3D inversion (Figure 5a).
  Also, the top banner in Figures 6 and 7 is not very clear: is it gravity or Bouguer anomaly? Please, plot the error on a separate independent scale to be more readable

- line 175: by "Bouguer anomaly" you mean the upward-continued regional trend? Please, specify. Same for line 219, 239, 270, 286, 295 and so on.

- Line 244: Does GMSYS perform 2D forward modeling or 2D inversion?

  This is a crucial detail. If it performs inversion, then more information is needed here. Or, have you tested several candidate profiles? Please, explain.

- Line 375-377: To my understanding, you obtain a Moho from 3D gravity inversion. But you do NOT obtain a Moho depth from 2D forward gravity modeling (see also question above). If you do not perform 2D inversion, then 2D forward modeling can only validate a certain profile, but not "provide" or "obtain" from it.

This is better formulated later in the conclusions, at line 442 “[...] validated by the 2D [...]”. Please, This should be clarified. And finally, why not using the 3D Moho results in the construction of the 2D models?