The manuscript by Wang and co-authors presents G&M3D, a software package with a graphical user interface to create a set of three-dimensional subsurface bodies. The bodies are either based on basic geometric shapes or freely drawn with the mouse on individual profiles and then combined into a 3D volume. The software furthermore allows the user to assign density differences and magnetic properties to the bodies and forward model the resulting gravity anomalies and magnetic intensity as well as their gradients. The authors demonstrate the software's capabilities in an application to the gravity anomaly caused by a real salt dome. The manuscript is well written, the text is clear in most places, and the content fits the scope of GMD. The Figures nicely illustrate how the graphical user interface looks and can be used.

There are some concerns/open questions regarding the flexibility and efficiency of the method, the accessibility of the software, and the clarity of the text. These can be addressed with moderate revisions. I will first list critical and overarching issues and then provide a list with smaller line-by-line comments below.

Major comments:

1) The authors often stress how efficient/fast computation is, but they are not using parallel approaches. I would like the authors to comment on the potential of further speed-up through parallelization. Did they deem it unnecessary with the current speed of the code? Would the implementation be problematic?

2) The authors mention inversion a few times but as far as I can see, an inversion would have to be done one model at a time and all by hand. That is not feasible. For inversion, it would be necessary to be able to automatically change properties without the GUI. Good studies to look at would be Galley et al., 2020, Spang et al., 2022 or de la Varga et al., 2019.

3) If I understand correctly, the algorithm saves time by skipping layers that don't have any anomalous bodies, but as soon as a single anomalous prism is detected, the entire layer is computed. Would it not be more efficient to only compute anomalous prisms? The way I imagine the current implementation, a vertical needle (1x1x100 prisms) would take much longer to compute than a horizontal one (100x1x1 prisms). Can individual prims not be skipped because of the matrix approach? Some clarification about this would help.

4) In section 2.2 and Figure 2, it is stated that the model domain and observation points are doubled in x- and y-direction but it is unclear what purpose this serves. Is it necessary for the computational method? Can other methods avoid this? How does this affect the computational performance.

5) For both gravity anomalies and magnetic field anomalies, there are analytical solutions for buried spheres (e.g., Lowry and Fichtner, 2020, p. 349). While the salt dome is a great example to highlight the capabilities of the irregular tool, a benchmark against these analytical solutions would be more convincing for the validation of the computational accuracy of the software. A setup with a few buried spheres could be used to test both gravity anomaly and magnetic field anomaly.

6) The manuscript makes no statement if and how the software can handle the existence of topography.

7) Another complication would be two anomalous bodies overlapping. For instance, a basaltic dike intruding into an older solidified granite intrusion. Can one body overwrite the properties of parts of another body?

8) In the zenodo repository, the authors provide a Windows executable and source code, but there are no instructions on how to use the software on Linux or Mac. A Readme with clear instructions on how to compile and launch the software on all 3 systems would greatly improve the accessibility of the software. Without such instructions, it cannot fill the role of a community software as advertised in the manuscript.

9) The authors state that open-source options for gravity and magnetic forward modelling are rare. But they do exist and should be cited and discussed in line 67. Options include: simpeg (Cocket et al., 2015), geomIO (Bauville and Baumann, 2019), eventhough it depends on matlab, SRBF_Soft (Ulug & Karslıoglu, 2022), Hogue et al., 2020, cited elsewhere in the manuscript, also Matlab. There seem to be more. Even if these don't exactly provide what the authors present, they are close enough to warrant acknowledgement and highlighting what advantages/disadvantages G&M3D has in comparison.

10) There is an inconsistency with the term density/density contrast. Equations 1-7 use rho for density contrast. Delta rho would be more appropriate. In the remainder of the text, the authors only use the term "density" while it should always be density contrast.

11) A great feature for the Irregular tool would be the possibility to load semi-transparent images into the background of the drawing domain (Figure 7). This would allow the user to match results of imaging surveys much more effectively. I don't know how feasible this is from the software point of view, but it would be a great addition.

12) The colormap used in Figures 9, 11, and 12 is not appropriate for scientific results. It is journal policy to use colormaps that allow readers with color deficiencies to interpret them. There are a number of perceptually uniform and deficiency friendly maps available in Matplotlib or at https://www.fabiocrameri.ch/colourmaps/.

13) Starting in line 164, the anomalous bodies are often referred to as models which is confusing as the whole domain should be the model in my opinion. Please stick with the term "body" or "anomalous body". This also affects the list of bodies in the GUI.

14) Please make sure that all units are given with positive or negative exponents instead of forward slash (i.e., g cm^-3 instead of g/cm^3).

Minor comments:

G&M3D is an intuitive name, but the text should still state once what it stands for.

L. 12-13: Rephrase: However, open-source tools that allow for both the flexible and interactive construction of source models and potential-field forward calculations are rare.

L. 14: "3D" has to be defined somewhere once.

L. 16-19: First sentence is unclear and confusing considering the following sentence. I think what the authors want to say is that the domain is divided into rectangular prisms and the 3D shapes mentioned in the second sentence are approximated by a collection of angular prisms. Please clarify.

L. 30: Give some examples of other less efficient techniques.

L. 66: Rephrase: Nonetheless, open-source options that .... are rare.

L. 69: It's debatable whether C++ is considered a high-level programming language.

L. 70: Please provide a link and ideally a citation for Qt.

L. 74: I assume that the mentioned software is based on Qt. Express that explicitly.

L. 81: The sentence is a repetition of the previous one.

L. 88: Unclear what "mass volume" means.

L. 92: Change to in-text citation, then colon, then equations. Same for magnetic equations.

Eq. 1: z should be z_0? Same for other equations.

Eq. 2-7: I guess "V" are the gradients. Please add clarification. Also, "\Delta \rho" would be more appropriate for density anomaly.

Eq. 8-10: arctan should not be in Italics.

Fig. 1: Observation point should be capital P.

L. 101: sin and cos should not be in Italics. Same in equations 17-20.

L. 102: "main magnetic field" appears to refer to the Earth's magnetic field. Please clarify.

L. 102: Then the scalar...

L. 112: Should be P(x_n, y_m, z_0) for consistency.

Eq. 21: Why semicolon instead of comma here?

L. 116: Does function t describe distance or decay of signal with distance? Please elaborate more.

L. 117: observation point P(...).

L. 130: it is unclear what this extension is for.

L. 133/134: it is also unclear why the field effects are computed in the extended area.

Fig. 2 caption: clarify that the extended observation points are red and source region observation points are black.

L. 152: two strategies, not several.

L. 159: explain what "vertical magnetization" means. Also, how does this affect gravity?

L. 169: I suggest using m or km instead of hm throughout the text. Hectometer is not a commonly used unit.

L. 173: I guess this is number of cells/prisms. Please clarify.

Table 1, caption: I suggest replacing "grid numbers" with "numerical resolution".

Table 1: I assume that number of observation points did not change in this test. Please clarify.

Table 1: Please demonstrate that the scaling of the code holds for larger numbers of prisms. At least until 800^3.

L. 180: “Table 1 shows...”

L. 185: These numbers are in seconds?

Fig. 4: Button in the GUI says “Setting” instead of “Settings”.

Fig. 4, caption: missing space after (a). Also, last sentence is unclear.

L. 218: Ellipsoids would also be good.

Fig. 6: The 3 panels on the right don't seem to align with what is in the main panel. At the very least the x-coordinates of the dark blue prismoid are not correct.

Fig. 9: “Forwarding Model” should be “Forward Model”. “Heigh” should be “Height”.

Fig. 9, caption: No space after (a) and (b).

L. 301: include year of publication or replace “Ennen’s” with "the author's".

L. 326: unit?

L. 327-328: This sentence is unnecessary in this context.

Fig. 11: What is the unit of V_ij?

Fig. 12: label of colorbar is overlapping with ”x10^-3”

L. 340: remove “and” at the end of the line.

References: Please provide DOIs for all references. This is journal policy.

References mentioned in the review:

Bauville, A., & Baumann, T. S. (2019). geomIO: An open-source MATLAB toolbox to create the initial configuration of 2-D/3-D thermo-mechanical simulations from 2-D vector drawings. *Geochemistry, Geophysics, Geosystems*, *20*(3), 1665-1675. https://doi.org/10.1029/2018GC008057

Cockett, R., Kang, S., Heagy, L. J., Pidlisecky, A., & Oldenburg, D. W. (2015). SimPEG: An open source framework for simulation and gradient based parameter estimation in geophysical applications. Computers & Geosciences. https://doi.org/10.1016/j.cageo.2015.09.015

Galley, C. G., Lelièvre, P. G., & Farquharson, C. G. (2020). Geophysical inversion for 3D contact surface geometry. Geophysics, 85(6), K27-K45. https://doi.org/10.1190/geo2019-0614.1

Lowrie, W., & Fichtner, A. (2020). Fundamentals of geophysics. Cambridge university press.

Spang, A., Baumann, T. S., & Kaus, B. J. (2022). Geodynamic modeling with uncertain initial geometries. Geochemistry, Geophysics, Geosystems, 23(6), e2021GC010265. https://doi.org/10.1029/2021GC010265

Ulug, R., & Karslıoglu, M. O. (2022). SRBF_Soft: a Python-based open-source software for regional gravity field modeling using spherical radial basis functions based on the data-adaptive network design methodology. *Earth Science Informatics*, *15*(2), 1341-1353. https://doi.org/10.1007/s12145-022-00790-y