Review of ms:
Seismicity and thermal structure of the St. Paul Transform System, equatorial Atlantic: Insights from focal depth analysis by de Melo et al. submitted to Solid Earth

This study investigates the seismically active St. Paul Transform System on the equatorial Mid-Atlantic Ridge by relocating focal depths of 35 earthquakes (Mw 5.3-6.9) along three Transforms (A, B, and C) with the use of regional surface waveform modelling. Results show that the seismogenic zone extends from 5 to 18 km depth, with the deepest events occurring in cooler central parts of the strike-slip segments and shallower events near ridge-transform intersections. The study is generally well-structured and presents results that are of interest to the Solid Earth community. I appreciate that the authors support their interpretations with thermal modeling and compare their findings to other Atlantic transform faults. However, there are some issues that require clarification and revision before the manuscript is suitable for publication. I recommend moderate revisions as outlined below.

Major points
The authors relocate 35 earthquakes using ISOLA through surface waveform modeling, which is not a standard approach for earthquake relocation. Could the authors clarify why they chose this method over more commonly used and less time-consuming techniques such as NonLinLoc or HypoDD? If ISOLA was used solely to refine event locations based on waveform fits without inverting for moment tensors, this should be clearly stated in the methodology and justified, as it differs from typical usage of the relocation codes.

The velocity model plays a key role in accurate depth determination. I recommend that the authors present the 1D velocity model used in the relocations, as it is critical for evaluating the reliability of the depth estimates.

In lines 148–158 and Fig. 2, the authors attempt to reduce lateral uncertainty by fixing one horizontal coordinate and adjusting the other. However, this approach raises concerns touching limitations of the approach and potentially introducing artificial constraints or bias into the solution. The relocation method appears primarily sensitive to depth rather than to lateral position. Without strong azimuthal coverage or near-source stations, the resolving power in latitude/longitude is limited. To more robustly assess and potentially reduce lateral uncertainty, the authors might consider synthetic resolution tests (e.g., checkerboard or spike tests) or keep the original lateral locations.

Additionally, the quality and resolution of Figures 1 and 8 should be improved.

Further points
l. 16 – catalog with 5.3³Mw³6.9 occurring -> correct it
l. 43 – with both strike-slip faulting -> also normal? Not mentioned. It should be both … and …
l. 44 – thrust faulting earthquakes -> I do not see any thrust faulting earthquakes in fig. 1, are they part of the interpreted dataset?
l. 74 – prominent topographic feature along transform A is the Atobá Ridge -> Not seen in Fig. 1, put it along with other geographical names (like Saint Peter and Saint Paul Archipelago) in Fig. 1
l. 101 – Seismotectonic of the St. Paul Transform System -> Seismotectonics of the St. Paul Transform System
l. 117 – Data acquisition -> better to use only Data (no field acquisition was done) or event combine two sections together into “Data and Methodology” since data from stations are discussed in following section

l. 120 – Include number of stations for each network
l. 118 – (M_W)>5.3 -> M_W>5.3 and be consistent throughout the ms
l. 139 – on Isola -> in Isola
l. 147 – across a grid e of sources -> within/across a source grid
l. 157 – values below 5 indicate -> where values <5 indicate
l. 162 – in Figure 3-5 -> in Figures 3-5
l. 178-179 – use italic for description of variables x, z
l. 232 – (*Shi et al 2021*). However, the author did -> (*Shi et al 2021*). However, these authors did
l. 232 – they did not consider the transform segmentation along the transform fault system neither -> they consider neither … nor …
l. 247 – The focal depth distribution along the transform faults -> indicate that all this concerns transform faults along the Mid-Atlantic rift zone (either in the title of the section or with the individual transform faults)
l. 269 – 10 kilometers -> 10 km
l. 282 – with maximum depth until the 600°C isotherm -> with maximum depth related to 600°C isotherm
l. 308 – Ocean-Bottom seismometer -> OBS seismometer or ocean-bottom seismometer
l. 336 – include Mid-Atlantic rift zone
l. 339 – 3-Compared with the thermal model, -> 3. According to thermal model,
l. 882 – (see Figure XX) -> which Figure?

Fig. 1 – needs improvement for clarity and readability. The overall size should be increased to allow visibility of details. This is the main figure for the reader, thus it needs more information to introduce the problem. The spreading rates (arrows) in individual segments would help to find out more about the tectonic setting; together, include motion along the transform zones.
I would also suggest excluding the ray path coverage in this figure since it blurs the setting. This can included in some further figure or in SI
(a) – The station names in (a) are illegible.
(b) – Also, this subfigure would benefit from enlarging.
The transform faults and rift zones should be clearly marked, and the beach ball symbols enlarged to distinguish them from white dots (presumably earthquakes without focal mechanisms).
The red and black focal mechanisms are difficult to differentiate; they should be displayed with more distinct contrast, maybe size.

Fig. 2 – include description of segments and geographical/geological features
Fig. 7 – maybe include the earthquakes locations?
Fig. 8 – indicate (a) and (b) rather than upper and lower
Labels of age are too small to read
I do not see black dashed lines in upper panel
There seem to be different earthquakes compared to Fig. 1 (e.g. I do not see any reverse in Fig. 1). Why do they differ? Explain, how they relate to Fig. 1 and include them there

Figs S01-S03 – include description of segments and geographical/geological features
Table S02 – correct the timing and make it consistent for all events (exclude PM and dop.)

I hope my suggestions help to improve the ms.
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