Comments on egusphere-2025-5460

This document represents a review report of the manuscript entitled "*Fault-Controlled Distribution of Pre-seismic Thermal Anomalies: Insights from the Dingri Earthquakes, Tibet*", by Li et al.

The manuscript presents an interesting study on the assessment of thermal anomalies associated with fault zones related to the seismogenic sources of two major earthquakes that occurred in the Dingri region (Tibet). The topic is relevant and potentially valuable for the understanding of pre- and post-seismic thermal signals. However, in its current form, I believe that the manuscript would benefit from substantial improvements in terms of writing clarity, figure presentation, and contextual framing.

First, references need to be handled more carefully throughout the manuscript. As currently written, they often interrupt sentence flow and reduce readability. When references are not grammatically integrated into the sentence, they should be placed within parentheses - e.g., "(Reid, 1910; Scholz, 2002; Rogers and Dragert, 2003)". This issue occurs repeatedly throughout the text, and there are also several typographical errors where references are attached directly to the preceding word without spacing (e.g., Lines 139, 258, 261, 263, 267, 274). Greater attention is recommended.

Several scientific and interpretative aspects – particularly concerning the rationale behind the selection of the images used to analyze the spatio-temporal evolution of thermal anomalies – have already been clearly and thoroughly addressed by Reviewer 1, and I generally agree with those remarks. I will therefore focus mainly on issues related to presentation, structure, and geological context. I do not comment in detail on the methodology, as it falls partially outside my direct expertise.

It is interesting to observe the evolution of thermal anomalies in the pre- and post-seismic periods associated with the two mainshocks. However, for the temporal evolution plots (e.g., Figures 4 and 8), I suggest considering a correlation with the temporal distribution of seismicity. In particular, it might be useful to present composite figures with vertically aligned panels, where the upper panel shows the thermal anomaly time series and the lower panel shows the temporal distribution of foreshocks, mainshock and aftershocks. This approach could strengthen the link between figures and text (e.g., Lines 183–185) and improve the overall interpretability of the results.

I also recommend expanding Section 2, particularly with regard to the tectonic and geodynamic framework underlying the seismic activity of the study area. Since the manuscript later discusses thermal anomalies associated with the Dingmu Co Fault and the Himalayan orogenic front, it would be helpful to:
(i) provide a more detailed structural description of these features (e.g., average dip angles where available of Dingmu Co Fault; more details regarding the Himalayan Orogenic front…);
(ii) include additional references supporting the geometric parameters of the fault zones mentioned.

One point that deserves clarification concerns the apparent mismatch between the seismogenic structure of the Dingmu Co Fault and the location of the epicenters of the two earthquakes discussed. The text states that the fault dips westward, whereas the epicenters appear to be located to the east. Additional information on fault geometry would be useful here. It is unclear whether the earthquakes studied occur on an adjacent synthetic or antithetic structure, or whether this discrepancy may be related to figure scale or epicentral location uncertainty. For instance, Wu et al. (2025) - doi: https://doi.org/10.1016/j.tecto.2025.230827 - show a different epicentral location for the January 7, 2025 earthquake provided by CENC, which appears more consistent with the deep geometry of the Dingmu Co Fault.

I also suggest indicating the scale at which the traces of the Dingmu Co Fault and the Himalayan front are represented within the main text, as they are highly simplified at the current scale.

It may also be useful to include a figure – maybe as a portion of Figure 1? - showing the detailed seismotectonic context of the area analyzed for thermal anomalies. Such a figure could include the rupture areas of the seismogenic sources of both mainshocks, as well as the locations of associated foreshocks and aftershocks, at a more detailed scale. Alternatively, the rupture areas could be shown (e.g., as dashed rectangles) within Figures 5 and 9. Given that the authors suggest that thermal anomalies may be related to frictional processes and stress accumulation along the main fault plane, it would be interesting to visualize the spatial relationship between surface thermal anomalies and the inferred rupture areas, especially considering the large spatial extent of the analyzed regions.

Additionally, I would like to raise two points more as curiosity and possible avenues for discussion rather than strict criticisms. First, it might be interesting to briefly comment on the spatial extent of the thermal anomalies. The maps in Figures 5 show more spatially extensive anomalies prior to the March 20, 2020 mainshock (smaller magnitude) compared to the January 7, 2025 event (larger magnitude; Figure 9), at least within the analyzed time window. This might appear counterintuitive and could potentially be related to foreshock activity or other controlling factors? Second, a clearer discussion on the origin of the anomalies observed along the Himalayan orogenic front would be welcome.

Here are other minor comments:

1. The name of the earthquake region should be made consistent throughout the manuscript (generally referred to as “Dingri” but reported as “Tingri” in the Abstract).
2. I suggest reporting earthquake magnitudes also in terms of moment magnitude (Mw), which is the most commonly used magnitude scale internationally.
3. Including the two studied mainshocks (with dates and magnitudes) in the Abstract would improve its completeness.
4. A subsection 2.1 is not necessary if there is no subsection 2.2.
5. Figure 1 could be improved by:
    - adding key toponyms (e.g., cities, villages, major mountain peaks) to help readers unfamiliar with the region;
    - reporting in the figure the Shenzha–Dingjie fault zone and the Lhasa block terrain mentioned in the text (Line 57);
    - replacing the current regional inset with a large-scale tectonic map highlighting major terranes and regional structures (e.g., Pozzi et al., 1982 - doi: https://doi.org/10.1038/297319a0; Metcalfe, 2013 - doi: http://dx.doi.org/10.1016/j.jseaes.2012.12.020 - o Zhang et al. 2014, doi: http://dx.doi.org/10.1016/j.gr.2012.08.024)
    - increasing font size and trying to reduce overlap between labels and map elements;
    - highlighting the trace of the seismogenic fault in a different color;
    - simplifying the figure layout by using the zoomed-in area as the main figure, which would improve the visibility of epicenter symbols in high-density areas;
    - adding information on fault kinematics (e.g., thrusts, normal faults, strike-slip faults) using symbols or color coding;
    - using a scale in kilometers instead of miles, consistent with altitude units in meters.
6. Generally, font size could be increased in all figures, as it could not be readable once the paper is physically printed, otherwise readers are forced to use the online version.

7. Typographical error in Line 107 (period instead of comma before “In general”?).
8. Line 108: “I exceeds 2, i.e., I > 2” can be simplified to “I > 2”.
9. Figures 5 and 9 still contain ideograms in the color bar; these should be translated into English. The epicenter location should also be indicated.
10. Caption of Figure 12 contains several minor typographical issues (spacing and punctuation).
11. Typographical errors are present in Line 294 (“Tibet”) and within the “Disclaimer” section.

To conclude, in the *Discussion* and *Conclusions* sections, the authors might consider slightly smoothing the wording in some statements, particularly where the robustness of the observed correlations is emphasized. While confidence in the results is certainly appropriate, a more cautious tone could help better reflect the limited number of fault zones and mainshocks analyzed, and the spatial scale adopted for part of the study.

I would encourage the authors to further refine the writing style in some sections, aiming for a more personalized and cohesive writing style. While the content is generally clear, certain passages appear rather standardized.