



REVIEWER'S REPORT

Manuscript No.: IJAR-50450

Date: 28/2/2025

Title:

Morphotectonic analysis by coupling a digital terrain model (DEM), radar data (Sentinel-1C) and field data from the Eastern part of the Ouaddaï massif (Eastern Chad)

Recommendation:

- Accept as it is
- Accept after minor revision.....
- Accept after major revision√.....
- Do not accept (*Reasons below*)

Rating	Excel.	Good	Fair	Poor
Originality		√		
Techn. Quality		√		
Clarity		√		
Significance		√		

Reviewer Name: Ahmed M. Saqr

Date: 28/2/2025

Reviewer's Comment for Publication.

(To be published with the manuscript in the journal)

The reviewer is requested to provide a brief comment (3-4 lines) highlighting the significance, strengths, or key insights of the manuscript. This comment will be Displayed in the journal publication alongside with the reviewers name.

The manuscript presents a valuable contribution to geological mapping and structural analysis in the Ouaddaï massif region by integrating remote sensing (Sentinel-1C), digital terrain models (DEM), and field data. The study's strength lies in its multidisciplinary approach, which enhances the understanding of regional morphotectonic features and lineament patterns. If methodological clarity, quantitative validation, and figure quality are improved, the study could significantly impact tectonic and resource exploration research in Chad.

Detailed Reviewer's Report

Thank you for submitting your manuscript titled "Morphotectonic analysis by coupling a digital terrain model (DEM), radar data (Sentinel-1C) and field data from the Eastern part of the Ouaddaï massif (Eastern Chad)" to International Journal of Advanced Research. The study provides an important contribution to geological mapping and structural analysis in the Ouaddaï massif region using remote sensing techniques, DEM, and field

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data. The integration of multiple data sources is commendable. However, several key aspects require major revision before it can be considered for publication. Below are my comments and suggestions to enhance the quality of the manuscript.

Comments for the Authors**1. Abstract**

The abstract should include quantitative details about the results, such as the total number of lineaments extracted, specific altitudes, and fracture orientations to provide a clearer summary of findings.

The abstract lacks a clear research objective. Please state why this study is necessary and what specific knowledge gap it aims to fill.

2. Introduction

The introduction provides a broad overview of the geology of Chad, but it lacks a well-defined research gap. Can you clarify why the study is important in the context of previous geological and morphotectonic studies?

Some references in the introduction are outdated (e.g., citations from the 1960s). Please incorporate recent studies (2022–2024) on remote sensing applications in structural geology.

3. Methods

The methodology section lacks a detailed explanation of data preprocessing. Can you elaborate on how you processed Sentinel-1C data and DEM to extract lineaments?

The software tools used (ArcGIS, SNAP, Geomatica, etc.) are mentioned, but there is no description of the workflow. A step-by-step process or a flowchart would improve clarity.

There is no discussion of error margins or uncertainty in DEM and radar data. Have you performed accuracy assessments or compared extracted lineaments with known geological features?

4. Results

Figures 3, 4, and 5 (topographic models and lineament maps) need better labeling and higher resolution. Consider adding color-coded elevation ranges and scale bars for better visualization.

The lineament density map should be supported with statistical analysis (e.g., lineament length distribution, clustering analysis) to validate interpretations.

5. Discussion

The discussion section mostly repeats the results without a critical analysis. How do your findings compare with previous studies in the region?

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Possible geological implications of the identified lineament orientations should be discussed in greater detail. Do they correlate with known tectonic structures or regional stress fields?

6. References

Several references lack complete citation details (e.g., DOI, journal names). Ensure proper formatting according to journal guidelines.

The most recent references (2022–2024) on remote sensing and DEM-based geological mapping are missing. Please include recent advancements in morphotectonic analysis.

7. Figures & Images

Figure 7 (geological formations) lacks a scale or geographic coordinates. Please ensure all images have legends and north arrows.

Figure 10 (fracture rosette) should include quantitative analysis (e.g., percentage of lineaments in each direction) to support interpretations.

8. Conclusion

The conclusion only summarizes the findings but does not discuss the broader implications. How can these results be applied in mineral exploration, groundwater studies, or earthquake risk assessment?

9. Language & Formatting

The manuscript contains grammatical errors and awkward phrasing. A language revision or professional proofreading is recommended.

The use of acronyms (e.g., DEM, DTM, SRTM) should be consistent throughout the manuscript, with proper definitions at first mention.