



BRITTLE DEFORMATION AND NEOTECTONICS OF THE SERRA DA CANTAREIRA RIDGE, PICO DO JARAGUÁ HILL, AND PERUS REGION – SOUTHEASTERN BRAZIL

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1 – INTRODUCTION AND STUDY AREA

The Northwestern sector of the metropolitan region of the São Paulo city (Southeastern Brazil) is formed by Pre-Cambrian metamorphic (schists, quartzites, phyllites, mylonites, and migmatites) and igneous rocks (granites, diorites and banded diorites). Despite the very old age of these rocks and their ductile deformation associated to the *Brasiliano* orogeny (500 – 800 m.a), brittle deformation has also been described, possibly related to a more recent Cenozoic tectonics that affected the upper crustal levels. Thus, the aim of this work is to investigate the brittle deformation of the mentioned area, in order to verify a possible intraplate tectonics acting since Neogene.

2 – METHODOLOGY

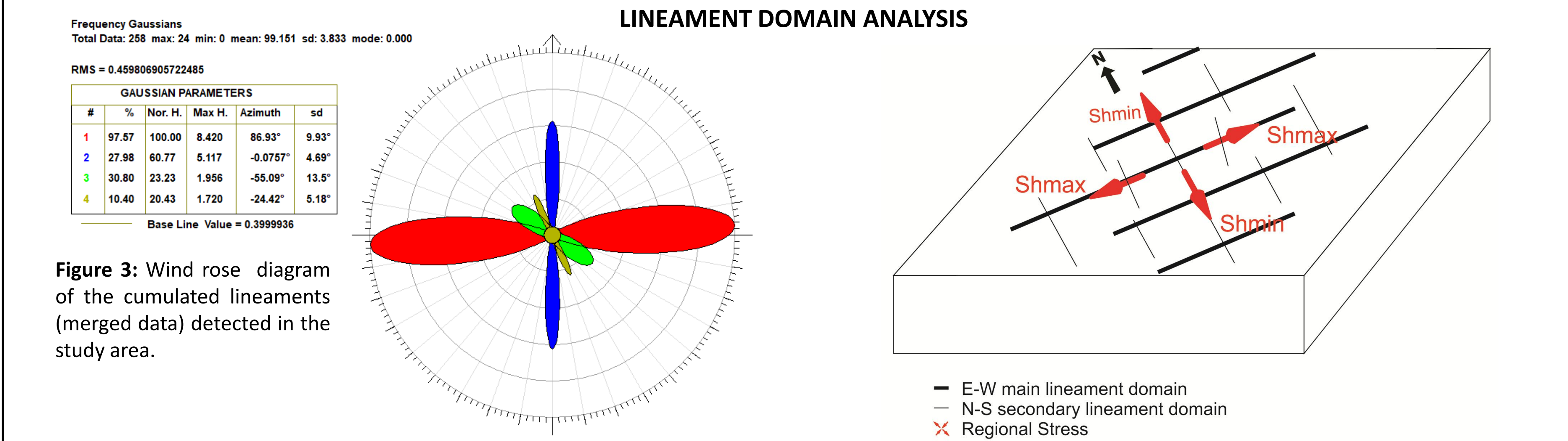
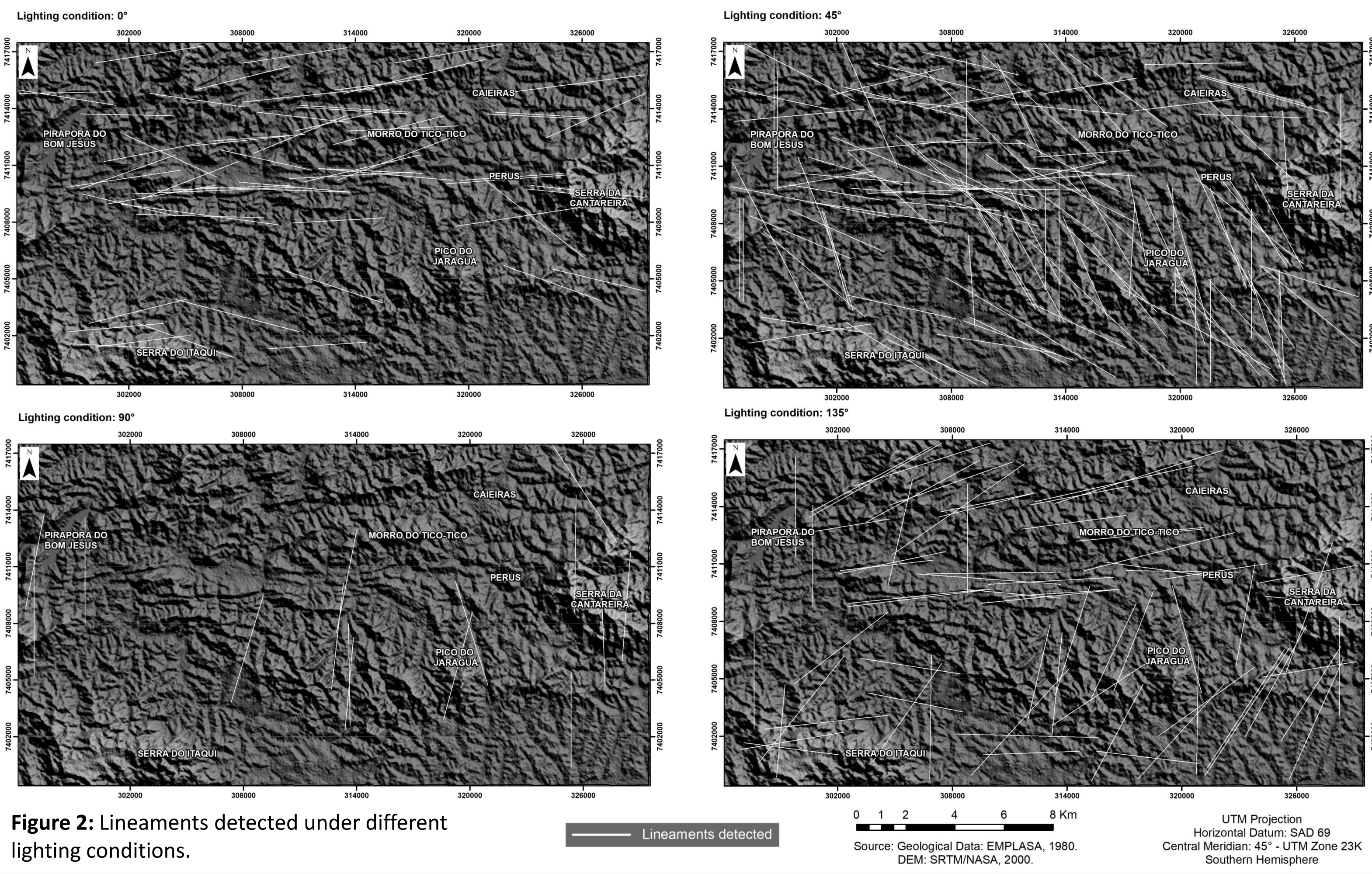
Firstly, lineament domains were automatically detected in the Shuttle Radar Terrain Mission data (DEM with 30m pixel resolution) by the SID3 software. Such data were cumulated into databases and statistically analyzed by the freeware Daisy software (<http://host.uniroma3.it/progetti/italab/Downloads/Programs>). Azimuthal frequency analysis by polymodal Gaussian fit of the data were performed to identify the main azimuthal trends (lineament domains), which provides information on the orientation of the crustal stress field.

Three sectors were selected to geomorphological mapping, where indicators (i.e. triangular facets) of tectonic deformation were identified. The geomorphological maps were performed through aerial photographs (1:25,000) by ArcGis software.

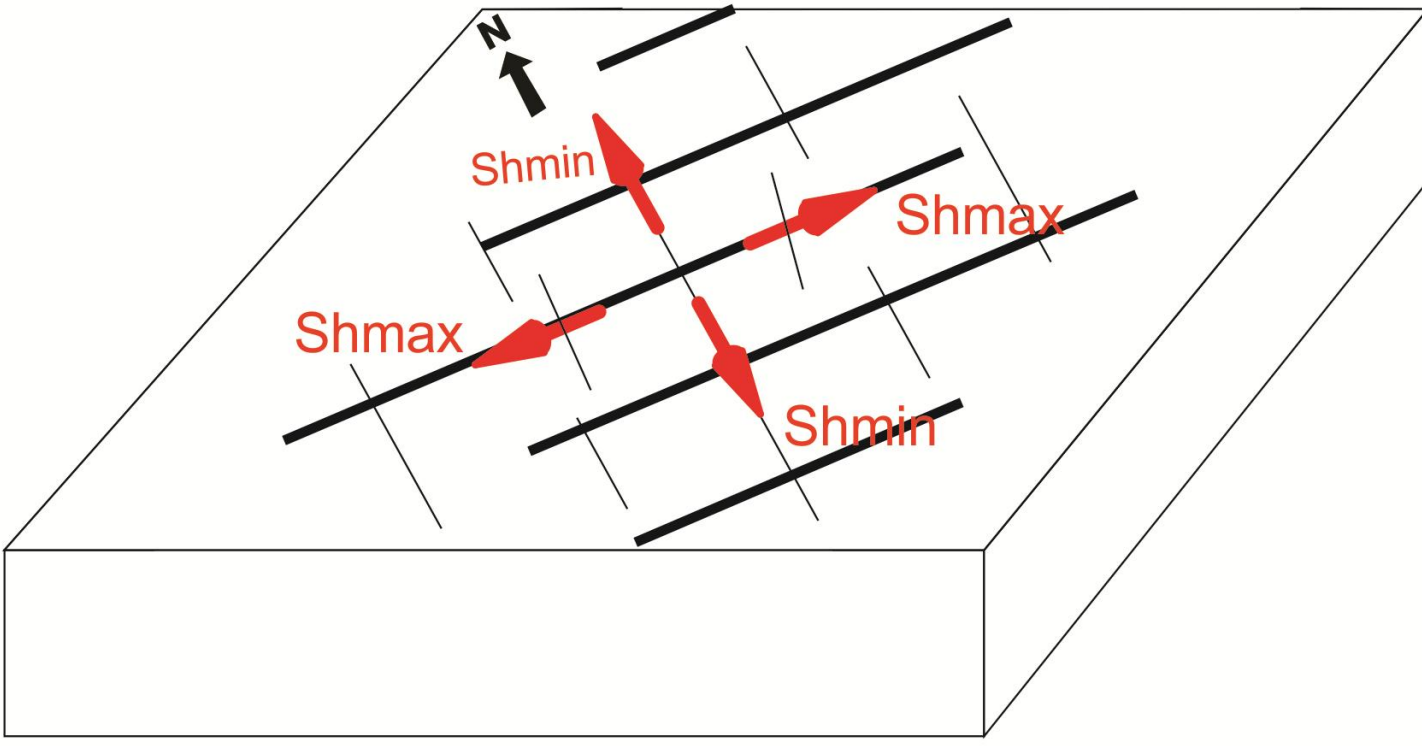
In the field, 736 structural data were surveyed and cumulated into databases by the Daisy software and statically analyzed in order to identify the main trends and understand the relations between the structures. The paleostresses were calculated through fault and fracture inversion by the original Montecarlo Approach. The multi-scalar data were analyzed together in order to verify a possible Neotectonic acting in the region.



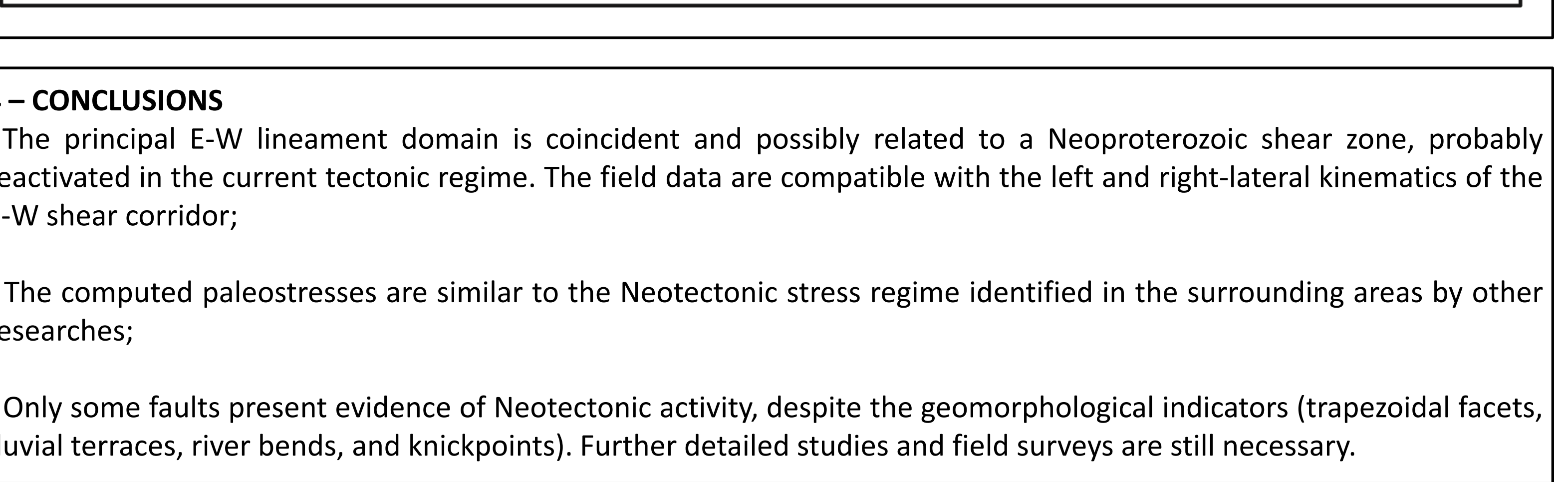
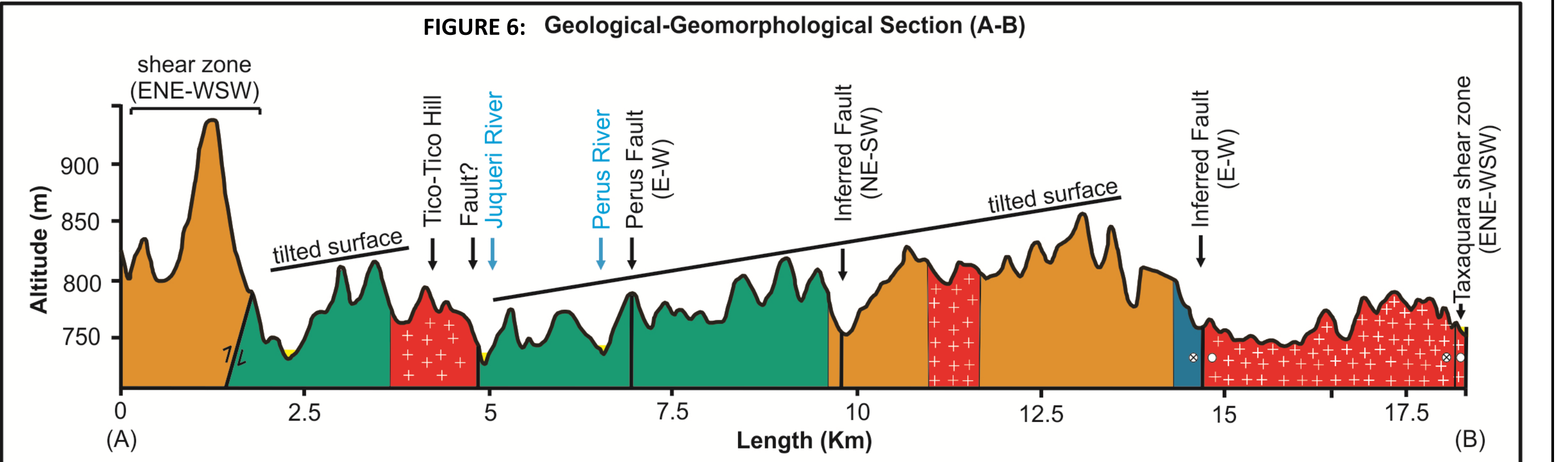
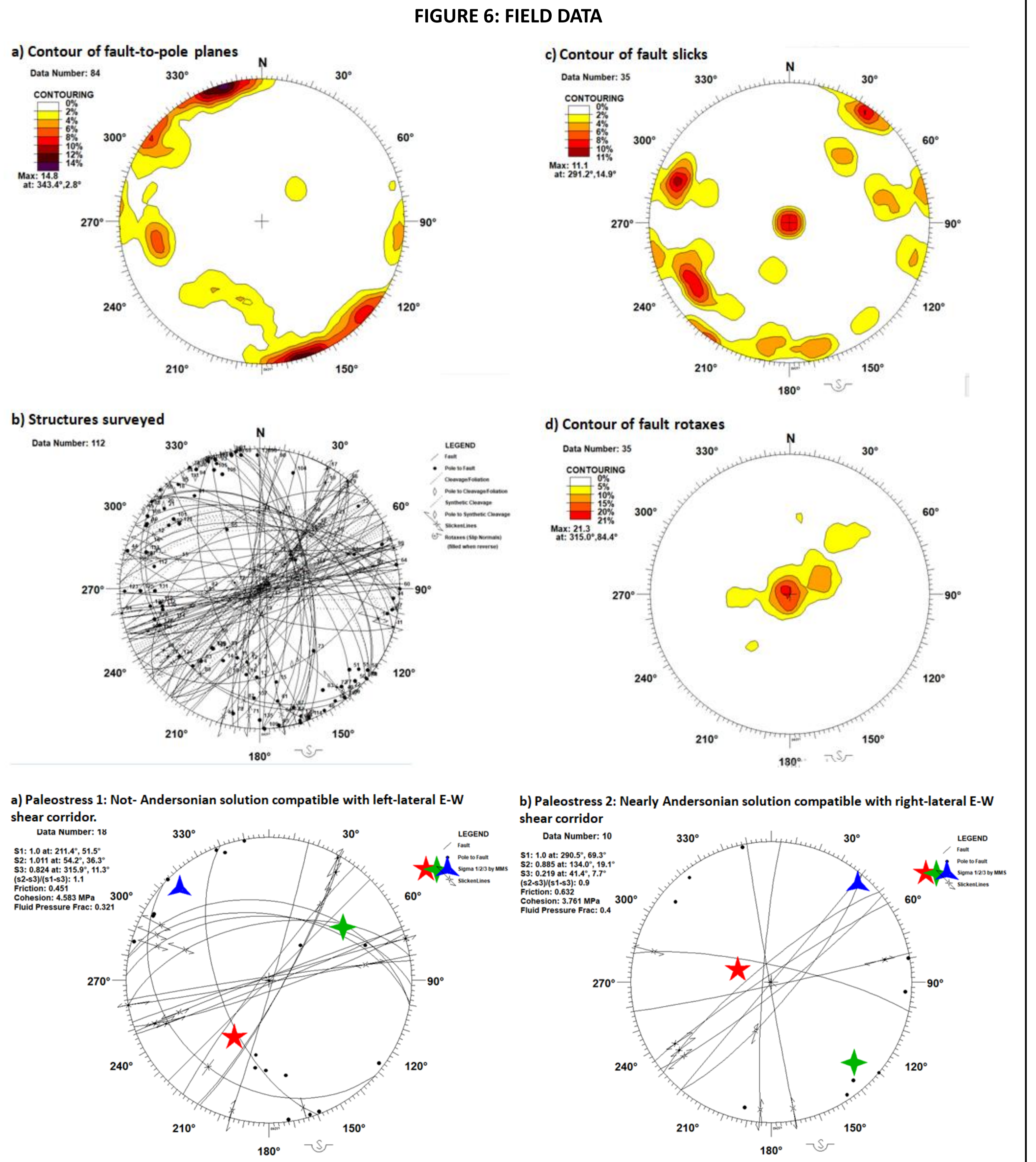
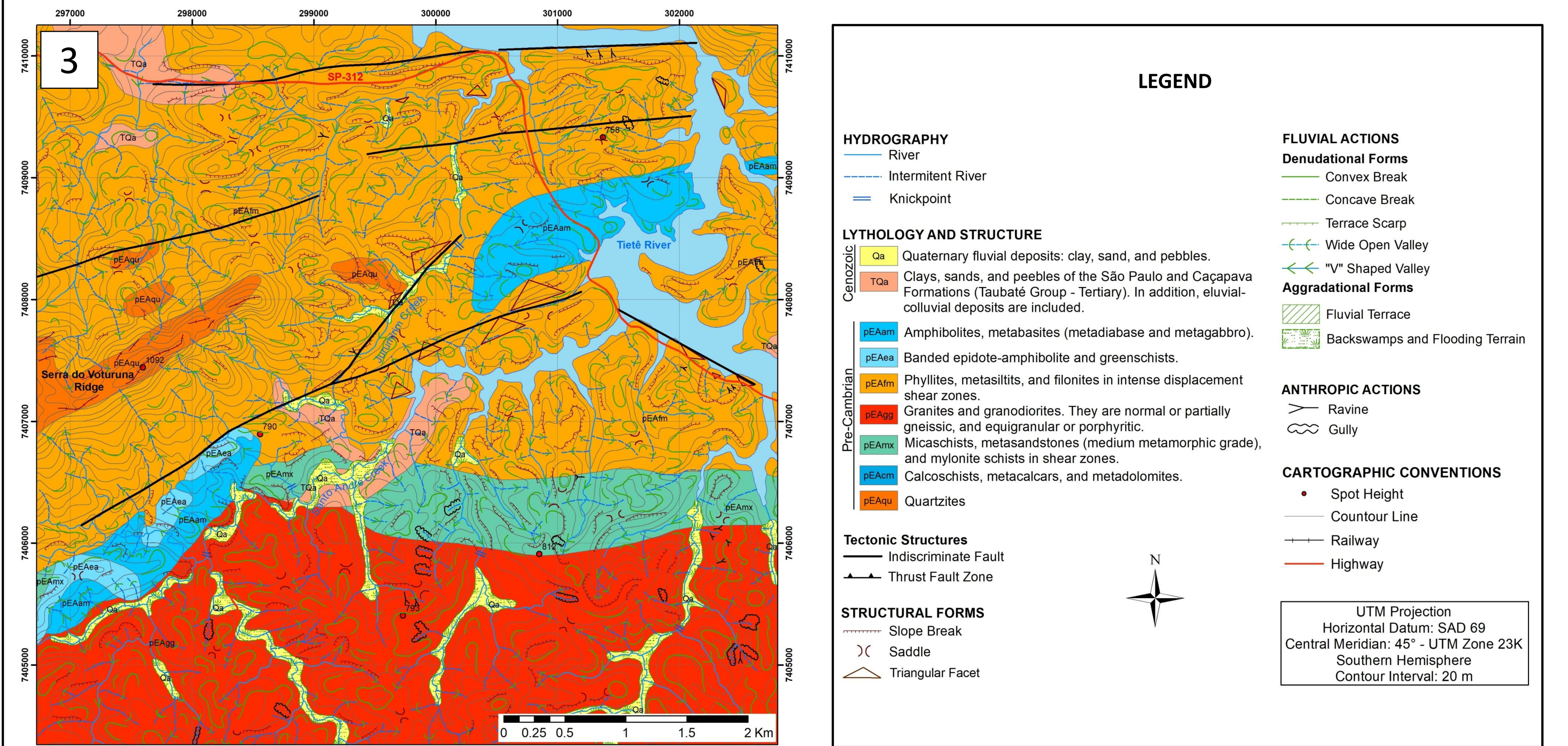
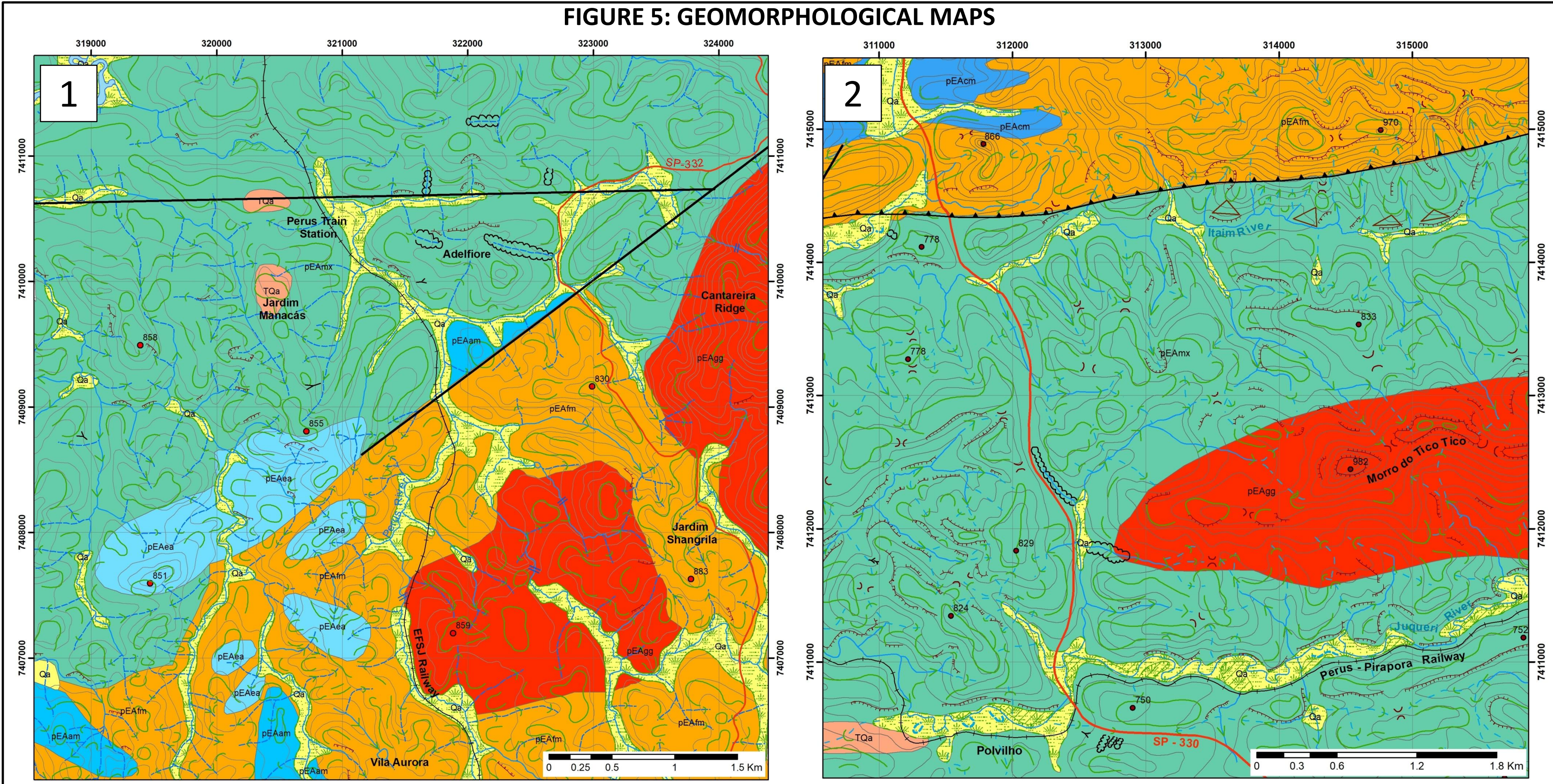
3 – RESULTS AND DISCUSSION



One **main principal domain, E-W** trending, was detected suggesting the parallel orientation of the maximum, crustal stress component. A secondary domain, N-S oriented, was found.



The lineament domains are nearly coeval and their formation is related to an **overall extensional regime characterized by the minor horizontal stress (negative module) E-W** trending.



4 – CONCLUSIONS

- The principal E-W lineament domain is coincident and possibly related to a Neoproterozoic shear zone, probably reactivated in the current tectonic regime. The field data are compatible with the left and right-lateral kinematics of the E-W shear corridor;

- The computed paleostresses are similar to the Neotectonic stress regime identified in the surrounding areas by other researches;

- Only some faults present evidence of Neotectonic activity, despite the geomorphological indicators (trapezoidal facets, fluvial terraces, river bends, and knickpoints). Further detailed studies and field surveys are still necessary.