Fracture evolution in the Paleozoic massif of Tichka (western High Atlas, Morocco): Remote sensing and structural analysis

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The Paleozoic massif of the Tichka massif, in the western High Atlas (Morocco), is limited to the south by the Tizi-N-Test major fault zone. This massif constitutes a structural transition between the Meseta and the Anti-Atlas domains. It was affected by Variscan, late-Variscan and Alpine deformations. This massif, known by numerous syntectonic plutons of granitoids, is considered as a key for the understanding of the structuring of the Variscan belt.

Fracturing is present in the various stages of structuring of this sector. The analysis of this fracturing at different scales makes it possible to contribute to the reconstruction of the main phases of this structuring.

In this work, various techniques of lineaments extraction were applied to the satellite images (Landsat ETM+ and Aster) and Digital Terrain Module (Aster GDEM). Using remote sensing in fractures mapping combined with tectonic and micro-tectonic analysis in the Paleozoic Tichka massif provides a significant contribution to understanding the evolution of fracturing during the structuring of this massif. The results obtained can be compared to the data available in other regions of the massif and Morocco. They permit to highlight the presence of a probable late-Variscan constraint that affects the whole granodioritic massif, and that the domains of the High Atlas and the Meseta have undergone a common tectonic evolution since the end of the Variscan folding period.

Keywords: Tizi-N-Test, Tichka, Variscan deformation, structuration, lineaments, remote sensing