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Neotectonics of the Algerian continental margin: Blocks rotations evidenced by a paleomagnetic analysis

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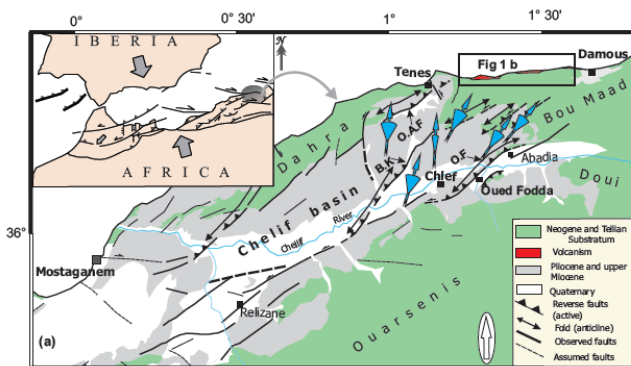
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The Tellian Atlas of Algeria underwent significant tectonics including compressional deformation during the Neogene time. Neotectonic features correspond to E–W to NE–SW trending folds and reverse faults affecting Quaternary deposits [1, 2, 3]. Figure 1 shows the Chelif basin with the Oued Fodda, Bou Kadir and Oued Allalah faults, which represent cases of NNE–SSW to NE–SW active structures in the E–W trending Tellian Atlas fold belt. This figure also indicates folding structures and distribution of the related faults, corresponding to imbricated thrust-and-fold structures [4]. The present paleomagnetic results confirm that the relative convergence motion between the Africa and Eurasia plates could be interpreted as a transpressional tectonic deformation model with block rotations along the Algerian continental margin.

The present paleomagnetic study has been conducted on volcanic rocks outcropping on the northern border of the Neogene Chelif basin, northwest Algeria. The results show the existence of numerous small tectonic blocks, of probable size around 0.5 to 0.6 km, which underwent clockwise rotations.



The magnitude of these rotations is often important and of different strengths according to the studied sites. That evidences the effect of a major narrow dextral E–W crustal shear structure. The location of this structure on the northern border of Chelif basin is coherent with the geodynamical context of this basin, which corresponds to a wide zone affected by clockwise rotations of large blocks limited by such major faults [5].

Figure 1: Tectonic map of the studied area [1,2, 3] O.F, B.K and O.A.F refer to: Oued Fodda, Bou Kadir, and Oued Allalah faults, respectively. Blue arrows refer to paleomagnetic directions from previous studies [6], while the white arrow indicates the expected magnetization direction. Offset: Main tectonic structures of northwestern Algeria [7]

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