



Stress patterns along strike-slip faults in Sistan and Baluchestan

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The Arabia-Eurasian convergence at about 2 cm/year is partly taken up by the deformation of the Iranian plateau. At the eastern boundary of the Iranian plateau, the N-S dextral Sistan-Baluchestan strike-slip zone stretches over 500 km along the border between Iran to the west and Afghanistan and Pakistan to the east, between the Lut block and the Afghan Helmand block. This strike-slip zone is made up of a series of N-S trending strike-slip faults associated with NW-SE trending folds, thrust faults, and topographic highs. Earthquake focal mechanisms attest to a dextral motion along the N-S strike-slip faults and of a reverse motion on the related thrust faults, controlled by a consistently NE-SW oriented regional compression. GPS data indicate that the Afghan Helmand block is fixed relative to Eurasia and that the Sistan-Baluchistan strike-slip zone takes up a dextral motion of about 15 mm/year, with the Nayband and Gowk strike-slip faults at 58°E on the west side of the Lut block.

This study presents the results of a recent field survey conducted in the Late Cretaceous to Cenozoic Baluchistan sedimentary series to characterize the evolution of the stress field at the southern end of the Sistan-Baluchistan strike-slip zone. The analysis of outcrop-scale fractures in this succession allows us to reconstruct local stress tensors and to infer the regional paleostress field during the Cenozoic. The Cenozoic tectonic history of Baluchistan is dominated by a compressional or strike-slip stress field. Preliminary results reveal drastic changes of the direction of compression (σ_1), clustering at N135°E, N90°E and N45°E. These results are interpreted in the framework of the geodynamic evolution of Iran since the Zagros collision.