

## **The significance of strike-slip faulting in the Zagros basement**

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Lateral offsets in the seismic pattern along the Zagros fold-thrust belt indicate that transverse faults segmenting the Arabian basement are active deep-seated strike-slip faults. The dominant NW-SE trending features of the Zagros belt has undergone repeated horizontal displacements along these transverse faults. These faults which are inherited from the Pan-African construction phase controlled deposition of the Phanerozoic cover before the Zagros deformation. We use observations on Landsat satellite images, the spatial distribution of earthquakes and their focal mechanism solutions to infer a structural model in the region.

Towards NW of the Zagros, deformation appears to be concentrated on a few widely spaced N-S trending strike-slip faults separating major structural segments including the frontal basement thrust. On the other hand, towards SE Zagros, domains of N-NW trending right-lateral faults in the NE part of the belt imply that fault-bounded blocks are likely to have rotated anticlockwise about vertical axes relative to both Arabia and central Iran. In contrast, the predominance of N-NE trending left-lateral faults in the SW part of the belt imply that the fault-bounded blocks rotate clockwise about vertical axes. We propose a structural model in which the crustal blocks bounded by strike-slip faults in a simple shear zone rotate about vertical axes relative to both Arabia and central Iran. The domains of strike-slip and thrust faulting in the Zagros basement suggest that some of the convergence between Arabia and central Iran is accommodated by (i) rotation and sideways motion of crust along the belt by strike-slip faults and partly by, (ii) shortening and thickening along thrust faults. The presence of the inherited N-S trending transverse faults in conjunction with the anticlockwise rotation of Arabia provide the most satisfying explanation for continental deformation in the Zagros.