



Deformation conditions, Kinematics, and displacement history in Dehbid Shear Zones, Iran

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The actively deforming Zagros fold-and-thrust belt is a result of the collision of the Afro-Arabian continent with the Eurasian continent. The separation of Arabia from the African plate and its subsequent collision with Eurasia was the last of a series of separation/collision events, all of which combined the extensive Alpine and Himalayan orogenic system NW-striking, NE-dipping duplexes are portions of the internal zone of the "Main Thrust" of the Zagros orogenic belt.

The studied shear zones are located in the northeast of the Dehbid city of southwest Iran. Shear zones developed in the Kowlikosh metamorphic complex in the study area. These developed in the rocks with pre-existing penetrative foliations at different scale. They are preferentially located in crystalline schists. Lower grade metamorphic rocks accommodated deformation by folding. The shear zones are linked in an anastomosing framework with similar properties. These structures are part of the Sanandaj-Sirjan metamorphic belt and the Zagros fold- and- thrust belt. This internal zone is characterized by penetrative plastic deformation dominates, and metamorphism up to greenschist facies with peak temperatures on the order of 300-350 °C based on comparison of plastic quartz and brittle feldspar microstructures, confirming a shallow crustal environment during faulting.

The area is affected by three phases of deformation, which resulted from an overprinting of pure

shear by simple shear during continuous plate convergence. The first relatively early phase (D1) is characterized by the development of regional NW-SE oriented foliation (S1). The second-phase (D2) produced the asymmetrical folding with the axial plane strike of NE-SW. The third-phase (D3) of deformation is related to shear zone development along the oblique convergence of the Afro-Arabian continent and Iranian micro-continent. Presence of the dominant dextral shear sense indicators in the area is consistent with the oblique dextral transpressional convergence.