



Structural evolution and kinematics significance of a tectonic mélange in the Afro-Arabian-Iranian convergence zone

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Understanding the nature and origin of tectonic mélanges is crucial to deciphering the evolution of orogenic belts. The purpose of this paper is to study the structure and kinematics of the Zagros Suture Zone by using macroscopic, mesoscopic and microscopic structures of a tectonic mélange and to re-examine the geological history of the region. The studied tectonic Mélange is juxtaposed against remnant forearc basin sequences by thrust faults and is composed of exotic ophiolite and sedimentary blocks, with different sizes and coherent turbidite beds, all embedded in a sheared scaly argillaceous matrix. The Zagros Suture Zone in the Afro-Arabian-Iranian convergence zone represents a collage of different tectonic units that record the closure of the Neo-Tethys Ocean from Late Cretaceous to Tertiary times. Structural and kinematic analyses in the study area indicate the interrelation of thrusting and dextral shearing in an oblique convergence tectonic setting. Quantitative structural analysis of deformed structures within the mélange revealed that the convergence direction between the Afro-Arabian continent and Iranian microcontinents varies from N5E to N10E. Estimates of kinematic vorticity number, indicate a realm of general shear for the study area. Kinematic vorticity number measurements demonstrate that strain partitioning between coeval simple shear (74%) and pure shear (26%) within the study area has played an important role in the development of the crustal tectonic wedge.