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Kinenimatics of the tectonic wedging of the oblique Zagros accretionary prism and lateral exhumation of the HP-LT metamorphic rocks, southwestern Iran.

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Southwestern Iran along the Zagros Suture Zone (ZSZ) provides an excellent typical oblique accretionary prism. The tectonic wedge consists of the upper sedimentary mélange unit and lower HP-LT metamorphic mélange unit. The upper sedimentary mélange unit displays type - I mylonitic fabrics with the σ-type and δ-type shear band cleavages. Type-II and type- III fabrics displays ribbon/stripes or fish-head, barrel-shaped boudins. The HP-LT metamorphic mélange unit with amphibolite, garnet amphibolite, eclogite, blueschist, kynite gneiss, and quartz-ribbon bearing gneiss show décollement-related deformation. The metamorphic and sheared rocks in this unit display polyphase deformation. This includes formation of S-C fabrics, superposed folding, asymmetrical rotated domino boudins, shear-band boudins, and folded boudins.

Micro-structural analysis of the quartz-ribbon c-axis fabrics, show that they display external and internal asymmetry, which has been, used as the shear sense indicators. The estimated mean temperature of deformation based on the opening angle of the quartz c-axis show $512^\circ \pm 50^\circ$C for the quartz ribbon-bearing gneiss. The estimated mean temperature for the quartzitic mylonite is $485^\circ \pm 30$C.

The tectonic wedge of the Zagros accretionary prism is bounded by the roof thrust of the Zagros Suture Zone and steeply dipping thrust .This led the lateral exhumation of the HP-LT metamorphic rocks above the NE-dipping subduction of the Neo-Tethyan oceanic crust. Presence of the blueschist assemblage in the lower metamorphic mélange confirms subduction of sedimentary mélange with the Neo-Tethyan oceanic crust. The oblique wedge was formed by the convergence of the Afro-Arabian

and Iranian micro-continent. Kinematic vorticity number (W_k) measurements by different method using microscopic- and mesoscopic-scales markers revels that simultaneous high-proportions of simple shear components (72%) relative to pure-shear components (28%) were involved for the formation of the tectonic wedge. This suggests that simultaneous contraction, strike-slip, oblique- slip and dip-slip may controlled the geometry of the wedge in the “general shearing” or “non-simple shearing” environments.