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Polyphase deformation and petrofabric analysis of Ali Abad Damagh shear zone, Northwestern Iran.

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Aliabad-e-Damag shear zone is exposed 35km south of Hamadan and southeast of the Alvand batholith. The shear zone is situated in the Hamadan metamorphic complex and located at the complexly deformed subzone of the Sanandaj-Sirjan zone of Zagros orogen. Four stages of deformation (D1, D2, D3, and D4) are identified in this area. D1 structures include First generation fold and first axial planar schistosity that haven't much clear evidences at the field. In this area D2 structures are recognized parallel to the axial surfaces of tight to isoclinal, recumbent folds shallowly plunging to NE or SW, with horizontal to sub horizontal axial plane schistosity, which is the predominant foliation in this area. D3 structures is The third generation foliation that is weakly developed parallel to the axial surfaces of upright, open to gentle folds. Type three interference patterns of three generation folds implying a parallel to sub-parallel progressive deformation stages. The second generation of folding created by flexural shearing and mylonitic rocks were produced during this stage. During D2 deformation, northeast-southwest oriented mylonitised Aliabad-e-Damag granite has been intruded in a strike-slip dextral ductile shear zone. Abundant enclaves exist in this deformed granite that all were strongly elongated along the main extension direction (X axis). Variety of the rate of ellipsoids of the enclaves changes in range of 2-28. The elongation of the enclaves concordant with the strain rate and development of the mylonitic foliation. Structural analysis of exposed rocks in this shear zone indicate that the mylonitic foliation is sub-vertical or steeply dipping to NW in the western half and shallowly to moderately dipping in the eastern half, but the stretching lineation is sub-horizontal sub-parallel to the strike of the mylonitic foliation throughout the shear zone. Dextral strike-slip displacement is identified by the shear sense indicators. Rotation of the eastern half against the western part occurred along the NW-SE trending Darreh-Gar strike-slip fault zone.