

Magnetostratigraphic constraints on the timing of deformation in Frontal Fars Arc (Zagros Folded Belt, Iran)

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Abstract: The Zagros Mountain Belt is the result of the closure of the Neo-Tethys Ocean during the convergence between the Arabian and the Eurasian plates. From NE to SW the belt is divided into five parallel structural domains (Figure 1): (1) the Urumieh-Dokhtar magmatic arc, (2) the Sanandaj–Sirjan metamorphic and magmatic zone, (3) the Imbricated Belt, (4) the Simply Folded Belt, and (5) the Mesopotamian-Persian Gulf foreland basin. The Simply Folded Belt and the Mesopotamian foreland basin are the most external domains of the Zagros orogen. The Mountain Front trace defines two salient (Lurestan arc and Fars arc) and two re-entrants (Kirkuk Embayment and Dezful Embayment). The beginning of compression in the Zagros Belt was loosely constrained until recent magnetostratigraphic works in the upper continental successions shed some light on the timing of deformation (Figure 1).

Magnetostratigraphic dating of syntectonic sediments indicates that deformation reached the frontal part of the Lurestan arc around 7.5 Ma and was active until the Pliocene-Pleistocene boundary (Homke *et al*, 2004). A similar study suggested older ages, around 11 Ma, for initiation of folding in the inner part of the Zagros belt (Emami, 2008). To the southeast, in more internal areas of the Simply Folded Belt near the NE side of the Fars arc, magnetostratigraphic dating indicates that folding occurred at 14–15 Ma (Khadivi *et al*. 2010). In order to extend and refine the timing of deformation in the frontal Fars area, a new magnetostratigraphic section was sampled in the Dowlatabad growth syncline. 208 sites were drilled along a ~ 2200 m stratigraphic section at an average sampling resolution of 10 m/site. The ages obtained were combined with ages provided by 5 samples for ⁸⁷Sr/⁸⁶Sr isotopes, 20 samples for calcareous nannoplankton and 5 large samples for low temperature thermochronology. Integration of all these results provides an accurate timing for the evolution of folding, drainage distribution and geohistory of this region.

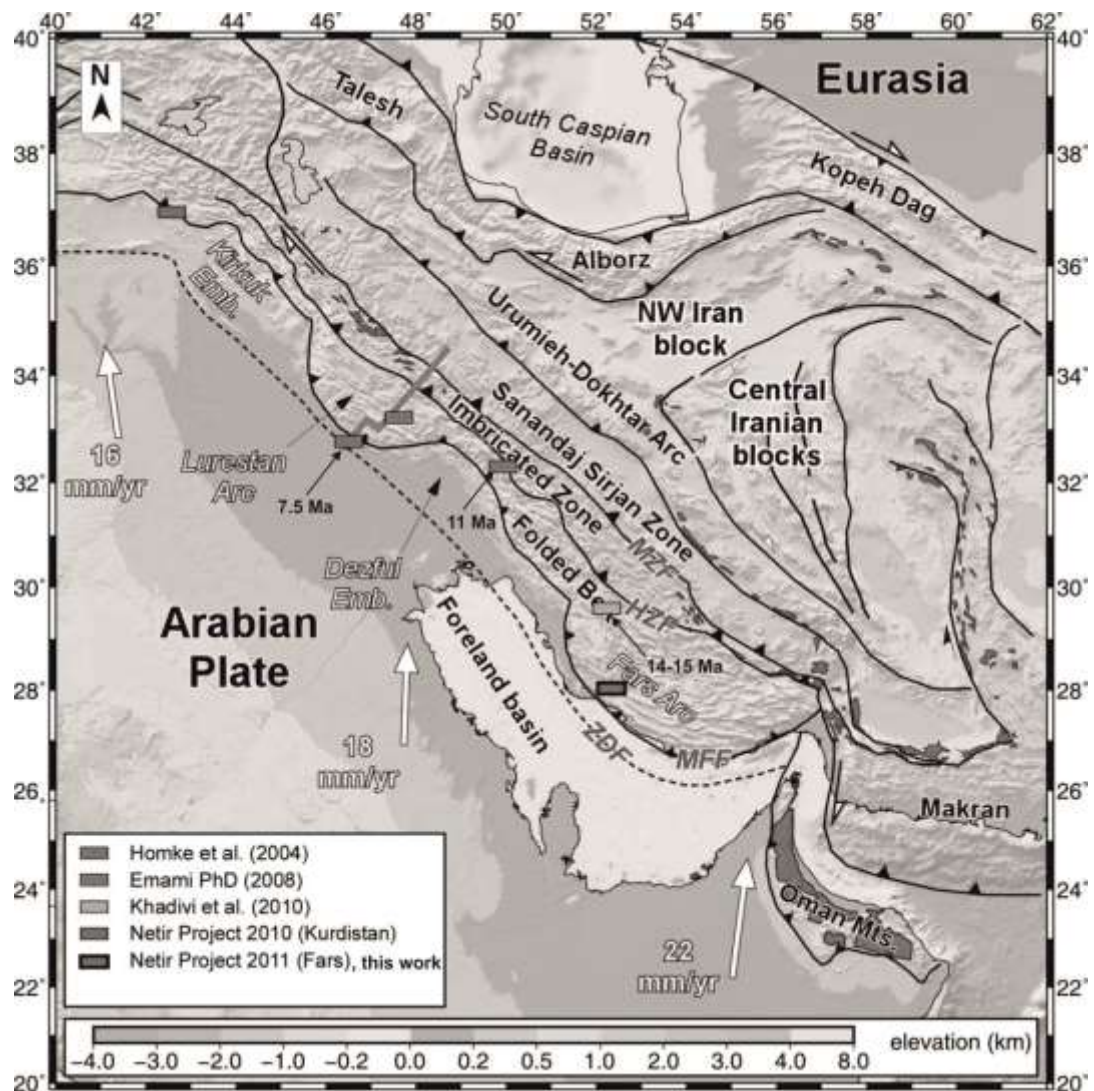


Figure 1. Map of deformed Iran between Eurasia and Arabia non deformed plates including the magnetostratigraphic sections in the Zagros fold belt.

Keywords: Magnetostratigraphy, Zagros Fold Belt, syntectonic sediments, Miocene, Pliocene

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