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Tectonic implications of the Oligocene mafic migmatites in the Takab core complex, NW Iran

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The Takab core complex of NW Iran is Archaean in age. Metamorphism up to granulite facies in the Takab complex has produced mafic migmatites with distinguishable leucosome, mesosome and melanosome parts in mesoscopic and macroscopic scale. The inherited zircons in the melanosome part yield an age of c. 2900 Ma (U/Pb zircon dating). The older ages from this study are comparable to the detrital zircon age of 3140[U+F0B1]2 Ma from the Menderes Massif (Kröner and Şengör 1990). The discovery of Archaean crystalline rocks in the study area adds to the plate tectonic scenario of a regionally extensive Tethyan suture zone, extending from western Anatolia (Menderes Massif) through Eastern Anatolia (Bitlis Massif) to western Iran (Takab Complex - Zagros Zone) and the Central Iran Zone. The newly grown zircons in the leucosomes give an age of 26.09[U+F0B1]0.82 Ma.
Partial melting in the Takab area was probably the result of crustal thickening related to subduction and closure of the Neotethys ocean and consequent collision of the Arabian plate and the Iranian micro continents during the Tertiary Alpine Orogeny (Agard et al. 2005). A widespread late extensional event leading to lithospheric thinning affected the rocks in the area after the Oligocene crustal thickening (Hajialioghli 2007). K-Ar dating of graphitic schists in the Zarshuran area (Mehrabi et al., 1999), apatite U-Th/He data from the Mahneshan area (Stockli et al., 2004), and 40Ar-39Ar dating of muscovite schists (Gilg et al., 2006) constrain the timing of significant exhumation of the rocks to post-date 20 Ma.

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