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Proto-Tethyan remnants in northwest Iran

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Abstract
The Iran continental crust was metamorphosed, intruded by granitoid magmas, folded and faulted during the Late Precambrian by the Pan African Orogeny. The basement complex in the Takab Complex (northwest Iran) consists of gneisses, amphibolites, pelitic schists, meta-ultramafic and calc-silicate rocks. Geochemically, the protoliths of the Takab gneisses are slightly peraluminous and medium to high-potassic with calc-alkaline affinity. These gneisses may have been emplaced in volcanic arc tectonic setting. Furthermore, the metapelitic protolith is shale deposited in an active continental margin setting. All these characteristics, and presence of paleo-suture zone and ophiolitic rocks (i.e. serpentines, meta-mafic and meta-ultramafic rocks) around the high grade metamorphic rocks suggest that a continental-margin magmatic arc (Andean-type) formed the Takab Precambrian basement. The basement complexes are extensively overprinted by the Pan- African Orogeny and younger igneous events; this supports the inference that Early Cambrian orogenesis in the Takab Complex region of northwest Iran marks one of the fundamental lithospheric boundaries within Gondwana which belonged to a greater Late Neoproterozoic–Early Paleozoic orogenic system that was active along the Proto-Tethyan margin of the Gondwana supercontinent, extending at least from its Arabian margin to the Himalayan margin of the Indian subcontinent.

Keywords: Northwest Iran, Takab Complex, Gondwana, Pan-African Orogeny