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Permo-Triassic paleomagnetism and paleogeography from Iran: new data from the Alborz mountains and the Nakhlak area

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Paleogeographic reconstructions of Iran blocks are strongly debated mainly due to the scarce availability of well-dated paleomagnetic data. New paleomagnetic analyses were conducted in the frame of the MEBE project on Middle–Late Permian "laterites" at the top of the Ruteh Formation near Aruh in the Alborz mountains as well as on middle Olenekian–middle Anisian (Early–Middle Triassic) sediments of the Nakhlak area, Anarak District. Paleomagnetic samples were thermally demagnetized and measured on a 2G DC squid cryogenic magnetometer located in a magnetically shielded room at the Alpine Laboratory of Paleomagnetism of Peveragno, Cuneo (Italy). Samples from the Middle–Late Permian "laterites" at the top of the Ruteh Formation showed the presence of well defined low inclination magnetic components carried by hematite and isolated between ∼200 and ∼680 ˚C that display a relatively good degree of grouping after correction for tilting (Declination = 319˚E; Inclination = -3˚ (N = 12; k = 17; a95 = 11˚). The Early–Middle Triassic samples from the Nakhlak area showed the presence of pervasive components with northerly and steep down directions in *in situ* coordinates isolated between ∼100 ˚C and ∼450-500 ˚C, occasionally up to ∼570-620 ˚C, and broadly aligned along a recent field direction. These components are regarded as overprints acquired during a recent pervasive thermochemical remagnetization event. Removal of these components revealed the occasional presence of scattered higher temperature components isolated between ∼450-500 and ∼620–680 ˚C and trending to the origin of the demagnetization axes. At one site taken in reddish nodular limestones these high temperature components are particularly well defined and grouped with tilt corrected mean Declination/Inclination of 31˚E/28˚ (N = 14, k

= 34, a95 = 6.9). We used these new data in conjunction with data from the literature from Iran and other adjacent Western Cimmerian blocks (e.g., Karakorum) to generate a set of paleogeographic reconstructions of the Tethyan area over the Permian and Triassic. As a main conclusion we suggest that the Western Cimmerian blocks migrated from southern Gondwanan paleolatitudes in the Early Permian to equatorial paleolatitudes in the ∼Middle–Late Permian to finally attain northern European paleolatitudes by the Middle Triassic; this is in substantial agreement with data from the literature albeit the timing of equatorial crossing of the Western Cimmerian blocks and of their approach to the Eurasian margin receives with these new data somewhat better chronological constraints.