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Combining apatite fission track results and geomorphic indicators in the Western Moroccan Meseta (coastal Variscan Paleozoic basement)

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In a section of the Western Moroccan Meseta different tools are combined in order to link the evolution of the topography to the general tectonic framework of western Morocco. Apatite fission track (AFT) data of granitic rocks of the Rabat – Khenifra area give ages around 200 Ma with track length distributions which are compatible with the thermal models already established for the area. A long post-Variscan thermal history is preserved in the apatite fission track thermal signal, showing several periods of cooling and heating that can be related to Jurassic to Early Creataceous rifting which seems to be widespread along the southernmost Variscan chain and also to the subsidence in relation to shortening which originated the Atlas and Rif belts. An inverse correlation between AFT ages and elevation is observed which is compatible with previous models indicating northward tilting of the whole Western Moroccan Meseta which is younger than 20-25 Ma. In order to test this possibility a detailed analysis of the topography at different scales in the Western Moroccan Meseta has been performed. Results indicate that two open folds with different amplitudes are recognised and that the one with wider wavelength could correspond to a lithospheric fold as previously stated by other authors on the basis of independent geological arguments. The northward tilting proposed based on the AFT data agrees with the results obtained in the analysis of the topography which reinforces the presence of a very open fold with a wavelength of 200-300 km in the north-western limb of the Western Moroccan Meseta.