

Intraplate Deformation in the Iberian Peninsula and Morocco Subsequent to the Pyrenean Collision

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Intraplate deformation, basins and ranges within the continental interiors, is currently ascribed either to asthenospheric ascent or to plate-boundary effective stress transmission. In the case of the broad, westernmost continental Africa (Nubia)-Eurasia interface, between the Pyrenees and the Atlas System, the arrangement of mountainous ranges and basins points to a single process of topographic evolution that can be explained as a pure-shear model of crustal shortening. In this tectonic situation, Iberia (the Iberian Peninsula) used to be firmly attached to Africa during most part of the Tertiary, in such a way that N-S compressive stresses could be transmitted from the Pyrenean collisional boundary. This tectonic scenario implies that most part of the Tertiary Eurasia-África convergence was not accommodated along the Iberia-Africa interface, but in the Pyrenean plate-boundary. Moreover, recent paleomagnetic data show indistinguishable paleopoles for Jurassic dykes in southern Morocco and central Iberia – a fact that precludes major N-S displacement between Africa and Iberia in post-Jurassic times. In this context, the early Oligocene up to late Miocene (postcollisional) N-S plate convergence is assumed in the interior of both Iberian and Moroccan interiors by means of the formation of several intraplate mountain chains and basins. Shortening in the Rif-Betics external zones must be conversely related to “local” driven mechanisms other than N-S convergence. The remaining NNW-SSE convergence, latest Miocene up to Present, is being also accommodated in a broad zone straddling Iberia and Morocco, at the same time as a diffuse new plate boundary is being formed between them.