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Slab pull and plate convergence, competing tectonic mechanisms in the Africa-Iberia plate boundary (western Mediterranean)

G. Booth-Rea (1), J.M. Martínez-Martínez (1), J.M. Azañón (1), F. Torcal (2) and V. Pérez-Peña (3)

(1) Departamento de Geodinámica and Instituto Andaluz de Ciencias de la Tierra, Universidad de Granada-CSIC, Granada, Spain, (2) Departamento de Sistemas Físicos, Químicos y Naturales. Facultad de Ciencias Experimentales. Universidad Pablo de Olavide., (3) Departamento de Geodinámica, UGR (gbooth@ugr.es)

Subduction rollback under the Alboran basin together with edge delamination under its margins have driven westward-directed extension, magmatism and regional uplift from the middle Miocene until recent in the western Mediterranean coeval to NW-SE plate convergence between Eurasia and Nubia. Slab-pull has driven W- to SW-directed syn- to post-orogenic extensional detachments, whilst plate convergence has mostly shortened the unloaded footwalls of the detachments producing ENE/WSW folded domes, both NW- and SE-directed reverse faults and strike-slip faults. Analysis of the footwall of the extensional detachments suggests that slab pull also drove a set of westward-directed contractive ductile shear zones that were active during the early-middle Miocene, partly coeval with the overlying extensional detachments. At present, it is not clear whether subduction rollback and delamination are active, with a strong discussion about the present activity of the accretionary wedge in the Atlantic. However, extension is clearly active in regions of the central Betics and a rather diffuse boundary can be drawn between regions where extension dominates situated to the west of a highly segmented extensional system and uplifted regions where plate convergence dominates producing folds, reverse faults and inversion of previous extensional-related faults. This diffuse boundary has migrated westward since the middle Miocene following the retreating slab and is located at present in the Granada

basin. Seismicity in the Granada basin commonly has both E-W- to NE-SW and NW-SE to N-S pressure axes, thus suggesting that the subducted or delaminated slab still has some effect on the regional strain distribution producing E-W directed shortening, whilst the orthogonal pressure axes would be related to the general NW-SE plate convergence setting.