



Regional-scale structure of the eastern pre-Betics fold and thrust belt (Spain)

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From Cretaceous times, the tectonic evolution of the Western Mediterranean domain is mainly controlled by the relative convergence between the African, Iberian and European lithospheric plates. This resulted in the formation of oceanic plate subduction zones for some segments and continental lithosphere collision and thickening for other segments of the active margin (e.g. internal units of the Betics Cordillera). From early Neogene times, the internal strain of the domain is substantially complicated by i) the detachment and retreat of some oceanic lithospheric slabs and ii) post-thickening extension in the internal parts of the orogenic belts. During this period, the continental crust developed structures which underline either extension or convergence across different adjacent domains.

The study area is located in the eastern part of the pre-Betics and comprises a particular "hinge zone" which connects the Betics Cordillera with the Valencia Trough, one of the Neogene basins formed during slab retreat extension processes. A field work study has been combined with a compilation of other published structural data using spatial analysis processing in a GIS. The use of such methods is fundamental if one wants to constrain the larger-scale structure of the crust from discrete and localised field observations. In this external part of the Betics Cordillera, major structures developed during Neogene times. The principal deformation patterns of the belt include: i) ENE oriented upright to reverse folds and associated northward verging thrusts in the Mesozoic sedimentary series. The particular non-cylindrical features in these struc-

tures show that, during the formation of the belt, (Triassic) décollement layers play an important role in the mechanical (de)coupling between the upper sedimentary series and the immediate underlying basement. ii) Syn-tectonic sedimentation is localised in narrow compressional basins. Ages of those sedimentary rocks show a global south to north migration of the deformation in the belt. iii) Regional-scale structural pattern is also partly controlled by the inherited extensional features that date from the segmentation of the continental passive margin formed during Late Jurassic - Early Cretaceous times in this area. iv) To the east, along the Costa Blanca, North-south oriented normal faults mark the south-eastern end of the Valencian extensional basin. The lateral transition between compressional and extensional structures is particularly rapid there.

Using GIS s.l. techniques, the spatial analysis of structural field data is powerful to get a regional-scale overview of the structures from local and discrete surface measurements and observations. Such an approach can be used, in particular, to link the superficial and deep structures geometry based on other geophysical data interpretations.

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