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Structure and tectonic evolution of the hinge zone between the Valencia Trough, the Betics and the Alboran Sea

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From early Neogene times, the geodynamic evolution of the Western Mediterranean area is both controlled by 1) the northward movement of the African lithospheric plate, relative to Europe, and 2) the retreat of oceanic lithospheric slabs that substantially complicates the internal strains in this area. During this period, the overlying continental crust developed structures which underline either extension or convergence across different adjacent domains. In spite of the fact that the deformation has already been studied in each one of those domains, the regime transition from one to the other is not clearly evidenced.

The study area is located south of Valencia, along the eastern coast of Iberia. It comprises the connection zone between the pre-Betics belt with the Valencia Trough and the Alboran and Algerian domains, the crust and lithosphere of which were significantly thinned during the Neogene. This project aims at determining the structure and evolution of this particular ‘hinge zone’. In this framework, our main objective is to characterise the lateral interactions between compressional structures in the fold and thrust belt and the extensional deformation in adjacent basins. A field study has been carried out in the Costa Blanca area, between Valencia and Alicante, with a particular emphasis on the eastern extremity of the ranges, at the transition between the fold and thrust belt and the Valencia basin. This work forms part of a larger-scale structural analysis done through a compilation of available geological and geophysical data which gives some boundary conditions for the tectonic evolution of this particular area.