



Extensional Detachment faulting in melange rocks. Plurikilometres migration by W the External Zone (Cordillera Bética, Spain)

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The synthesis and correlation of units carried out in the continuous geological map (Roldán et al., 2012), has revealed a fragmentation of the carbonate outcrops belong to the Subbetic Domain (García-Hernández et al., 1980). Subbetic NW verging thrust and fold axial traces have not lateral continuity and Jurassic carbonate outcrops appear as klippen on the olistostromic unit. These ductile structures that can be observed in the internal structure of these Jurassic blocks are unrelated to the brittle-ductile deformation bands observed at the basal pelitic levels. Basal detachments are rooted in: a) the Olistostromic unit, a Upper Langhian-Lower Serravallian breccia constituted by gypsum-bearing clay and marls; b) Cretaceous-Tertiary marly sedimentary rocks (Rodríguez-Fernández, et al., 2013). In both kind of rocks, cataclastic structures allow to infer a top-to-the WSW displacement. Paleostress measurements, made on these detachments levels, are compatible with an extensional regime (Roldán et al., 2012). At the same time, the analysis and interpretation of subsurface data (seismic surveys and borehole testing) shows that the Subbetic Domain (External Subbetic, Molina 1987) are affected by westward low-angle normal faults. A balanced cross-section, based on morphological and cartographic data in the area between Sierra de Cabra and Sierra de Alta Coloma (Valdepeñas de Jaén), shows plurikilometric displacements which have been produced during Late Serravallian-Early Tortonian times.

References:

- García-Hernández, M., López-Garrido, A.C., Rivas, P., Sanz de Galdeano, C., Vera, J.A. (1980): Mesozoic paleogeographic evolution of the zones of the Betic Cordillera. *Geol. Mijnb.* 59 (2). 155-168.
- Molina, J.M. (1987). Análisis de facies del Mesozoico en el Subbético. Tesis Doctoral, Univ. Granada. 518 p.
- Rodríguez-Fernández, J., Roldán, F. J., Azañón, J.M. y García-Cortés, A. (2013). El colapso gravitacional del frente orogénico alpino en el Dominio Subbético durante el Mioceno medio-superior: El Complejo Extensional Subbético. *Boletín Geológico y Minero*, 124 (3): 477-504.
- Roldán, F.J., Azañón, J.M. y Rodríguez-Fernández, J. (2012): Desplazamiento extensional del Subbético entre las sierras de Cabra y Alta Coloma (Valdepeñas de Jaén. Zonas Externas de la Cordillera Bética). VIII Congreso Geológico de España Oviedo. GEOTEMAS, V-13: 484.
- Roldán, F.J., Rodríguez-Fernández, J., Villalobos, M., Lastra, J., Díaz-Pinto, G., Pérez Rodríguez, A.B. (2012). Zonas: Subbético, Cuenca del Guadalquivir y Campo de Gibraltar. In GEODE. Mapa Geológico Digital Continuo de España. Sistema de Información Geológica Continua: SIGECO. IGME. Editor Navas, J. Disponible en: <http://cuarzo.igme.es/sigeco.default.htm>