

Neotectonic and Active Tectonic Deformations in the Tabernas Desert (Almeria, Betic Cordillera, Spain)

C. Sanz de Galdeano¹, J. Galindo-Zaldivar², S. Shanov³, A. Radulov³, and G. Nikolov³

1 Instituto Andaluz de Ciencias de la Tierra. CSIC-Univ. Granada. Fac. Ciencias. 18071 Granada

2 Dpto. Geodinamica, Fac. Ciencias, Univ. Granada, 18071 Granada

3 Geological Institute, Bulgarian Academy of Sciences. Acad. G.Bonchev Street, building 24. 1113 Sophia, Bulgaria

The Tabernas Desert is an upper Neogene basin situated in the eastern prolongation of the Alpujarran Corridor (south of sierras Nevada and Filabres, SE of Spain). There, the Betic Internal Zone, formed by metamorphic rocks, constitutes the basement where were unconformably deposited Tortonian to Quaternary sediments infilling the basin. Important dextral E-W faults cross it and limit great antiforms mainly formed in the basement. Moreover, there are NNW-SSE and NNE-SSE faults. All these faults affect Pliocene and Quaternary sediments. The Gergal earthquake (04-02-2002) and its aftershocks are probably related to the NNW-SSE faults.

The E-W faults cut longitudinally the Internal Zone helping to its progressive westward displacements. They are the older faults of the area, although also present young displacements. The E-W folds are something oblique to the present ellipsoid of stress but probably they are forced by the previous existence of the E-W faults. For this reason we interpret that they respond to the same state of compression of NW-SE to N-S direction. The formation of the NNW-SSE and NNE-SSW faults is consequence of the approximately ENE-WSW extension, coexisting with the compression and practically perpendicular to it. In this case it is necessary that the position of ?1 change to a vertical position. In fact, sometimes in the Betic Cordillera the extension is more important than the compression.

One possible interpretation of the position of the earthquakes of Gergal, in the north part of the basin, is that the NNW-SSE faults are propagating northwards from the south where formed previously, although the existence of young morphologic features linked to them indicates that they are active in all their range.

Key words: Betic Cordillera, Neotectonics, Active Tectonics, Active faults.