Interaction of Main Strike-Slip Faults in Eastern Betic Cordilleras (SE Spain)

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Trans-Alboran shear zone (TASZ) has been considered a deep fracture zone with related volcanism, crossing the Betic- Rif Cordilleras. Two of the main structures in TASZ are Palomares NNE-SSW and Carboneras NE-SW oriented strike-slip faults that separate the southeastern end of the Betic Cordilleras and the Alboran Sea- South Balearic basin thin continental crust. Their activity, beginning in the Miocene, has been broadly discussed on the literature, and most of the authors suggest a sinistral strike-slip regime with extensional episodes. These two oblique oriented major faults, with very straight cartographic traces, should undergone a large geometrical interaction that is not evidenced at their intersection. The relationships between the activity of Palomares (PFZ) and Carboneras fault zones (CFZ), has not been further discussed and it is the aim of this contribution, taking into account new brittle deformation data. The microfaults and joints palaeostress determination evidence, during the Messinian, a clockwise rotation of compression from NW-SE to NNE-SSW, favoring the sinistral strike-slip of the CFZ and the development of large folds. During the Pliocene, an anticlockwise rotation of stresses produces NNW-SSE compression. These stresses favored the sinistral activity of the PFZ, with regard to CFZ. Finally, during the Quaternary an ENE-WSW extensional setting and predominated NNW-SSW to NW-SE compression, favored the sinistral strike-slip activity of the PF regarding the orthogonally oriented CF that may act as a transfer fault, accommodating the displacement of secondary NW-SE normal faults. The geological field and geomorphological data also suport the most intense recent activity of the PFZ, determining the coast line orientation. This fault zone probably displaces the CFZ which shows only local evidences of recent sediment deformation and minor physiographic feature displacements.

Keywords: Palomares Fault, Carboneras Fault, paleostresses, recent tectonics