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Present strain partitioning in SE Spain. Insights from CGNSS data

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SE Iberia Tectonics is presently dominated by the NNW-SSE convergence between the Eurasian and Nubian plates. Farther east, the eastern Spanish coast and the Valencia Trough are dominated by ENE-WSW extension related to thermal subsidence. This extension has been interpreted as the final stage of abort rift responsible for the ENE motion of the Balearic promontory. Our data from 11 CGNSS stations permit us to discuss the deformation partitioning in SE Iberia related to the two abovementioned processes.

We identify three kinematic domains: a relatively stable domain, a domain moving towards NNW and undergoing NNW-SSE shortening, and a third domain relatively moving towards ENE and experiencing ENE-WSW extension. Our results indicate that plate convergence-related NNW-SSE shortening is mainly absorbed by the Eastern Betic Shear Zone (EBSZ), in agreement with previous studies, but also show that a significant fraction of this shortening is accommodated south of the EBSZ.

We also identify and quantify for the first time ENE-WSW extension northeast of the EBSZ. We propose that this extension could be absorbed by basement normal faults whose surface expression is obscured due to decoupling of deformation between the basement and the cover. Our results shed light on the tectonic puzzle of SE Spain.