## Paleoseismological and active tectonics studies on the offshore Bajo Segura Fault Zone (SE Iberian Peninsula – Mediterranean Sea)

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The Neogene and Quaternary faulting activity in the SE Iberian Margin is dominated by a large left-lateral strike-slip system, the Eastern Betic Shear Zone (EBSZ) that stretches over more than 450 km. The northern terminal splay of the EBSZ correspond to the Bajo Segura fault zone (BSFZ) that extends further into the Mediterranean Sea. The instrumental seismicity around this fault zone is mainly characterized by small to moderate earthquakes. Even though, moderate to large historical earthquakes have affected the zone, being the Torrevieja earthquake (1829; IMSK=X) the largest.

In September 2008 the marine geophysical cruise EVENT-SHELF was carried out (Spanish RV Garcia del Cid). One of the main goals was to map the sub-seafloor active structures (faults and folds) of the offshore area of BSFZ using high-resolution seismics (Spaker GeoSpark 6kJ) in order to characterize their Quaternary activity. A total of 10 regional profiles were acquired along and across the BSFZ with 30 cm of resolution at 1.5 km water depth with 400 m of penetration below seabed.

The results from the analysis of the high resolution seismic profiles have showed the presence of a serial of structures (faults and folds) in the sub-seafloor that are related to the structures described on the onshore. Moreover, these structures are active since they are deforming Quaternary units, in some locations the younger discontinuity (aprox. 20 ka) and, even, the seafloor. To characterize the seismogenic parameters of the active faults we have calculated the maximum magnitude earthquake and the recurrence interval of events using empirical relationships. Nevertheless, given the high resolution of the seismic profiles, it has been possible to perform a marine paleoseismological analysis allowing to identify individual seismic events and therefore obtain the time passed between specific.

The active structures (faults and folds) described on the onshore Bajo Segura basin propagates towards the Mediterranean Sea from 10 to 60 km. Most of these structures are active since they are deforming Quaternary units and it has been possible to characterize their seismogenic behaviour. In a seismic profile and given their high resolution, specific earthquakes and their time interval have been identified for a fault.