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Seismicity in West Iberia: small scale seismicity recording from a Dense Seismic Broadband Deployment in Portugal (WILAS Project)

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Over the last years several projects targeted the lithospheric structure and its correlation with the surface topography, e.g. EarthSCOPE/USArray or TOPO-EUROPE. Two projects focused on the Iberian Peninsula, one giving particular attention to the southern collision margin (TOPO-MED) and the other to the central cratonic Massif (TOPO-IBERIA/IBERArray). These projects mostly rely on deployed dense seismic broadband (BB) networks with an average inter-station spacing of 60km, which strongly increases the available network spatial coverage. The seismicity recording in such networks is critical to access current rates of lithospheric deformation.

Within the scope of project WILAS – West Iberia Lithosphere and Astenosphere Structure (PTDC/CTE-GIX/097946/2008), a 3-year project funded by the Portuguese Science & Technology Foundation (FCT), we deployed a temporary network of 30 BB stations in Portugal between 2010 and 2012, doubling the total number of operating BB stations. Together with the permanent and TOPO-IBERIA stations, the resulting networks provided a full and dense coverage of the Iberian Peninsula.

The majority of the permanent stations in Portugal, aimed at the seismic surveillance, are located in the southern part of the country in result of the active tectonic convergence between Iberia and Africa. Therefore, the temporary stations were mainly deployed in the north of Portugal. These temporary stations allowed an improvement of the earthquake detection threshold. The detection of seismic events was based on the analysis of daily spectrograms of the entire network, the new events detected being analysed and included in the catalogue. The new detected events are located mainly in the north, with magnitudes as low as 0.5 ML and in the offshore in the Estremadura Spur. Some additional events were also located south of Portugal, between the Gorringe Bank and the Gulf of Cadiz, in this case the lower magnitudes being $\sim$2.0ML.

Focal mechanisms will also be presented for chosen events, obtained both from first motion polarity methods (for smaller inland earthquakes) and from full waveform modelling (for larger events, M>3.5).