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Seismic reflection profiling of the Baza Basin (Southern Spain) - Preliminary results

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The intra-mountain Baza Basin in Southern Spain is the largest of the Late Neogene continental basins of the Betic Cordillera. It provides an up to 2.5 km thick archive of lacustrine and ancillary continental deposits from the last 7 million years. Due to the specific conditions of the sediment deposition, the Baza basin is an unique site for paleo-climatic studies including studies of climate change and paleo-climatic events in the western Mediterranean as well as on a global scale. A planned ICDP drilling project (LARSEI - LAcustrine Record of SE Iberia) proposes to drill the Baza evaporitic basin in order to analyze in detail the sedimentary record.

Prerequisite for future drilling activities is the profound knowledge of the basin structure and local zones of neo-tectonic deformation, mainly related to the Baza fault bounding the basin to the west. Therefore, controlled-source seismic measurements are used to investigate the subsurface of the Baza Basin. The aim of the measurements is 1) to study the structure of the sedimentary basin and of the fault system bounding the basin, and 2) to provide structural information for the planned scientific drilling project.

End of October 2013 a net of three 2D seismic profiles was acquired crossing the Baza Basin and the bounding fault system. Each of the profiles was 18 km long and all profiles were arranged crossing each other. A vibroseis source (two vibrators with 200 kN peak force each) was used with a source point distance of 60 m. At each source location 8 sweeps using a frequency range of 8 – 100 Hz were conducted. A cable-free acquisition system consisting of more than 330 stand-alone digital data recorders was spread along each individual profile. The recorders, having a distance of 20 m, were moved in a roll-along configuration.

The seismic data of the three profiles were conventionally processed. We present current results of the ongoing seismic reflection processing.