



The structure of the eastern Betic Cordillera (SE Spain) according a seismic reflection profile

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The BT3 multichannel seismic profile was acquired by the CGS in 1977 for hydrocarbon exploration in the eastern Betic Cordillera. A paper copy was scanned and vectorized by REXIMseis Ltd, and has undergone post-stack processing, including a coherence filtering and a deconvolution. In the SE end of the profile a broad-band seismic station was located near the Village of Vélez Rubio and its receiver functions have been analyzed by Julia et al. (2005) in order to investigate the structure of the underlying crust. We have used these Vp data in order to convert to depth the profile. The profile has a mean SE-NW trend, with a SE-section of 44 km length followed by a NW-section of 20 km length. The record includes the first 4s (twtt) which corresponds to 12 Km. Two main areas can be imaged in the profile. In the SE-end of the profile, a band of high-amplitude discontinuous reflectors dips towards the north with a thickness of 100 to 200 ms, increasing northwards. This band reaches the surface at the top of the Malaguide Complex (the upper complex of the Internal Zones of the Cordillera). Over these reflectors, an area with chaotic seismic facies with no reflectors corresponds with the outcrops of the olistostromes and turbidites of the Flyschs Trough Units, and is overly by discontinuous reflectors in location of the Subbetic rocks. In the NW-end of the profile, a set of high-amplitude continuous reflectors shows the location of the Prebetic with SE dips. Below these reflectors, oblique reflectors of intermediate-amplitude indicate the location of the Variscan basement. Over the Prebetic, we have marked the location of the basal thrusts of the Intermediate Units and the Subbetic. Using this seismic data and also field observations we propose a geological cross-section of the upper crust of the eastern Betic Cordillera and a model of the late evolution of the orogen. In this model the Internal Zones and the

Subbetic where welded from the Middle Burdigalian to the present-day and acted as an orogenic wedge deforming the Intermediate Units and the Prebetic.