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# The Crustal Structure of the Central Iberian Zone form the ALCUDIA Deep Seismic Reflection transect.

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The ALCUDIA transect is a 250 km long, vertical incidence Vibroseis seismic reflection profile acquired in 2007. It extends IBERSEIS transect to the N and NE imaging from within the Ossa Morena Zone (OMZ) to the Central Iberian Zone (CIZ) from 20 km south of Fuenteovejuna in the S to Toledo in the N. The southern part of the transect samples the suture zone between the OMZ and the CIZ. It continues in a N-NE direction crossing the Pedroches batholith and a series of relatively long wavelength synclinal structures limited by sub-vertical and relatively narrow folds (e.g. the Almaden syncline, the Alcudia anticline). Lower Paleozoic quartzites and slates cover most of these synclynal structures. Farther to the N, the profile crosses several major faults system (e.g Santa Elena and Toledo) . The acquisition parameters, 35 m station spacing, 70 m VP spacing resulted in a 60-90 fold high resolution seismic reflection image. A 20 s long Vibroseis sweep with frequencies between 8-120 Hz was recorded by a 400 station recording cable a long a 14 km long split spread configuration. The new processing sequence significantly increased the signal-to-noise ratio. It includes: crooked line geometry, geometrical divergence corrections, elevation statics, surface-wave attenuation, surface consistent zero-phase spiking deconvolution, time-variant band pass filtering., refraction and residual static corrections velocity analysis, NMO, surface consistent amplitude balancing, CMP stacking F-X deconvolution. The seismic image reveals the geometry of the suture between the OMZ and the CIZ. This is a reworked transpression suture (the Badajoz-Cordoba Sherar zone) includes the Central Unit (CU) as a north dipping wedge structure limited by two bands of reflectors that reach the middle crust (5 s twtt). This CU includes amphibolites with some oceanic affinity, orthogneisses, paragneisses, schists and minor amounts of peridotites. To the north the upper crust shows a moderate reflectivity that can be easily correlated with surface geologic features, mainly folds. These upright folds appear to be detached from the middle crust, being evidenced by the flat upper limit of the reflectivity and some individual subhorizontal reflections. The mid-to-lower crust is characterized by a high reflectivity which contrasts with the small amount of deformation registered in the upper crust. This highly reflective bands, located at 4,5 to 10 s (twtt), thickens towards both ends and is most probably inherited. The base of the crust is marked by a relative high amplitude band of reflectivity. The crust-mantle transition is imaged at, approximately, 10 s (twtt) as a sharp contrast in reflectivity, from the highly reflective crust to and almost transparent upper mantle. Beneath CDP
§ 10.000-11.000 a high amplitude wedge of reflectivity dips south into the mantle for 10-15 km. For the interpretation of this feature three dimensionality cannot be ruled out, nevertheless, it is indicative of a complex structure result of deformation and is most probably related to the suture zone between the OMZ and CIZ