



## **Crustal Deformation Styles Along the Reprocessed Deep Seismic Reflection Transect of the Central Iberian Zone (Iberian Peninsula)**

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The multichannel normal incidence deep seismic reflection profile ALCUDIA was acquired in summer 2007 and is 230 km long. This transect samples an intracontinental Variscan orogenic crust going across, from north to south, the major crustal domain (the Central Iberian Zone) and a suture zone with the Ossa-Morena Zone (the Central Unit) that build up the southwestern part of the Iberian Peninsula basement. The multichannel deep seismic high resolution (60-90 fold) profile images 20 s (TWTT), about 70 km depth. The reassessment of this data aims to provide better structural constraints on the shallow and deep structures. The ALCUDIA seismic image shows an upper crust c. 13 km thick decoupled from the comparatively reflective lower crust. The shallow reflectivity of the upper crust can be correlated with surface geological features mapped in the field whereas the deep reflectivity suggests imbricate thrust systems and listric extensional faults. The reflectivity of the mid-lower crust is relatively continuous, revealing high amplitude, and horizontal to arcuate reflection events delineating boudinage shaped geometries. A transpressional flower structure can be interpreted from the seismic image which involves a subcrustal mantle wedge. The ALCUDIA seismic image reveals a laminated c. 1.5 km thick, subhorizontal to flat Moho indicating an average crustal thickness of 31-33 km. The seismic signature of the Moho varies along the transect being highly reflective beneath the Central Iberian Zone (CIZ) and discontinuous and diffuse below the Ossa-Morena Zone (OMZ). The gravity response across the ALCUDIA transect suggests relatively high density bodies in the mid-lower crust of the southern half of the transect. The seismic results suggest two major horizontal limits/discontinuities, a horizontal discontinuity at c. 13-15 km (the Conrad discontinuity) and the Moho discontinuity located at a depth of c. 31 km.