



Crustal structure and composition to the S of the Spanish Central System: Effect of Alpine reactivation in an internal Variscan domain

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The ALCUDIA Project has acquired vertical incidence and wide-angle reflection seismic data in the Variscan Central Iberian Zone of Spain. The NE-SW, ~300 km long profiles sample an area going from the suture between the Variscan Central Iberian and the Ossa-Morena Zones in the S to the boundary between the former and the Alpine Central System to the N.

Although crustal thickness appears to be fairly constant along most of the Central Iberian Zone, a gradual increase of 3-5 km in the northern half of the profile is clearly imaged by the wide-angle data. This increase in the Moho depth is accompanied by a decrease in the thickness of the layered lower crust from the Toledo Anatectic Complex to the N. Right in this area, the amount of Variscan metasediments diminish and the surface geology is characterized by granites, migmatites and by the Madrid Basin, a foreland basin of the Alpine Central System that is part of the bigger Tagus Basin. The increase in crustal thickness identified in the neighborhood of the Central System is also accompanied by a slight increase in the Poisson ratio values, which even though still below 0.25, they are higher than those observed in the southern part of the profile, far from the influence of the late Variscan melting episode and of that of the Alpine tectonics.

Two scenarios are considered to take part in the Moho deepening near the Central System: Firstly, the Alpine reactivation causing this mountain belt has increased the crustal load giving rise to a foreland basin and a moderate crustal thickening. Also, a gradual change in crustal composition to the N, incorporating denser and more basic rocks, might also play a role in the average crustal density and contribute to Moho deepening by isostatic readjustment. The importance of each of these process is, as yet, unknown. However, the next acquisition of the CIMDEF project wide-angle reflection dataset across the central part of the Iberian Peninsula, crossing the Central System, will surely shed some light on this issue.