



Tectonic and deep structure of the Southeast Iberian margin

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We combine refraction and wide-angle reflection data (WAS) collected by Geomar/CSIC-Barcelona in 2006 aboard the German R/V Meteor, and multichannel seismic reflection data (MCS), acquired during the TOPOMED-2011 survey with the Spanish R/V Sarmiento de Gamboa, to investigate the tectonic structure and crustal nature of the Southeast Iberian margin and the adjacent Algerian basin.

We present a ~ 240 km-long 2-D P-wave velocity model obtained by traveltime inversion of WAS data and a nearly coincident ~ 90 km-long MCS poststack time-migrated profile acquired from the Southeast Iberian margin to the Algerian basin in a NNW-SSE direction. We interpret two different basement domains by comparing our velocity model with existing continental and oceanic crust velocity compilations. The first crustal domain covers the oceanic Algerian basin from 20 to ~ 100 km and shows a total thickness of ~ 5.5 km. It is characterized by a two-layer velocity structure ranging from 5 to 6 km/s in the upper crust and from 6 to 6.8 km/s in the lower crust. The second crustal domain extends from ~ 125 to ~ 180 km under the SE Iberian margin. WAS data indicate a ~ 20 km crustal thickness suggesting a continental velocity-structure. However, the boundary between continental and oceanic crust appears as a transition zone from ~ 125 to ~ 100 km with velocities neither strictly continental nor oceanic. WAS data show crustal thinning from ~ 18 to 12 km and MCS data corroborate the rapid thinning of continental crust towards the SSE from ~ 6.5 to ~ 3 s twt in less than 30 km.