



Crustal structure beneath the Rif Cordillera, North Morocco, from active seismic profiling

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The crustal structure along different domains of the Rif Cordillera is being investigated by active seismic methods (RIFSIS project). In a joint experiment between Spanish, Moroccan and American scientists, an 18 days-long operation was carried out in October 2011 involving about 50 participants in 25 field teams. Up to five shots of 1T each have been detonated at selected sites in North Morocco and recorded by about 900 Texans stations deployed along two profiles, in N-S and E-W directions respectively. Average station spacing was about 750 m along the 330 km-length profiles. The N-S line was extended northwards by a 70 km long segment in Spain, on the Betics. Southwards, this profile connects with the one recorded in 2010 across the Atlas Mountains (SIMA experiment), hence delineating a 700 km-long wide-angle seismic transect across the Betics-Rif-Atlas systems. A complementary operation involving onshore-offshore recordings in Spanish and Moroccan sides of the Western Alboran Basin could be performed in parallel, taking advantage of a marine multichannel seismic experiment ongoing in the Alboran Sea during the same period, using the facilities of the Spanish 'Sarmiento de Gamboa' vessel. Preliminary analysis of processed datasets already reveals the existence of major variations in crustal thicknesses, especially along the E-W profile that documents differences of more than 10 km in Moho depths. The thickest crust is found beneath the external Rif domain, with a rapid thinning eastwards, in the foreland and Atlasic terranes up to the Algerian border.