Image of the Iberian Tethys paleomargin beneath the eastern Betic mountain range

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We obtain P-wave receiver functions from recordings at a dense seismic broadband transect, deployed along 170 km across the eastern Betic orogen in south Spain. Migrated images show the crustal structure of the orogen in detail. In particular, they reveal the situation of the subducted Iberian paleomargin, with full preservation of the proximal domain and the ~50 km wide necking domain. Crustal thinning affects the lower continental crust. The Variscan crust of the Tethys margin is bending downward beneath the Betics, reaching ~45 km depth, and terminates abruptly at a major slab tear fault. The distal domain of the paleomargin cannot be reconstructed, but the migrated section suggests that material has been exhumed through the subduction channel and integrated into the Betic Orogene. This supports an origin of the HP-LT Nevado-Filabride units from subducted, hyperextended Variscan crust.