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Slab tearing and delamination under the Betics, Western Mediterranean region

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We image and map the crustal and lithospheric structure under the northern continental branch of the western Mediterranean tectonic region. We use P-receiver functions calculated in a dense seismic network. The images show that the subducted South Iberian continental slab is delaminated and missing under most of the Betics. However, the Iberian slab is still present beneath the western Betics reaching depths of approximately 60 km under the Granada basin. The edge of the delaminated slab has an irregular geometry possibly having teared along normal and transform fault segments at the transition from continental to oceanic crust of the Iberia paleomargin. Slab tearing is still operating at the western Betics close to the Gibraltar strait where intermediate seismicity occurs. In this area, the Iberian slab is attached to the oceanic slab imaged under the Alboran basin by tomographic techniques.