Geophysical Research Abstracts
Vol. 15, EGU2013-1137, 2013
EGU General Assembly 2013

New insights into the origin of the subduction component in Late Oligocene magmatism in the Ronda peridotite (southern Spain): geodynamic implications for the western Mediterranean

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Several tectonic scenarios have been proposed for the Tertiary evolution of the Betic-Rif chain in the westernmost Mediterranean. Recent studies on late, mantle-derived Cr-rich websterite dykes in the Ronda peridotite have revealed recycling the involvement of sources of continental detrital sediments in the waning magmatic stage of the Ronda peridotite (Marchesi et al., 2012). This new data are consistent with a subduction-related setting for the late evolution of the Alboran lithospheric mantle before its final intracrustal emplacement in the early Miocene (Garrido *et al.*, 2011). Detailed structural studies of Ronda plagioclase peridotites show that large-scale, ductile folding of peridotites—associated to the development of LT-LP plagioclase peridotite tectonites and ultramylonites—occurred during a contractional event before intracrustal emplacement of peridotites (Hidas *et al.,* 2013). These authors have proposed that this event was related to inversion of a back-arc basin, followed by failed subduction initiation that ended into the intracrustal emplacement of peridotite into the Alboran wedge. This new structural data leads us to hypothesize that the crustal component observed in late, Cr-rich websterite might come from fluids produced by dehydration of underthrusted crustal units in the earliest stages of subduction initiation.

Here we present new trace element and Sr-Nd-Pb-Hf isotopic data in whole rocks from Flysch sediments from the Betic cordillera and the underlying crustal units of the Ronda massif, which may account for the timing and geochemical signature of the Ronda Cr-rich pyroxenites dykes. These units correspond to the Flysch trough composed of turbiditic deposits, formed in the region between Iberia and Africa during Late Oligocene-Early Miocene, and the underlying crustal unit of the Ronda peridotite known as the Blanca unit. These new data are used to constrain the potential role of different crustal sources in the generation of the Late Oligocene subduction-related magmatism in the Ronda peridotite, and its implications for geodynamic models of the western Mediterranean in the Cenozoic.

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