Geophysical Research Abstracts
Vol. 20, EGU2018-15686, 2018
EGU General Assembly 2018

Unraveling the Polymetamorphic Evolution of the Alpujárride Alboran Basement in the Westernmost Mediterranean

Antonio Acosta-Vigil (1), Carlos J. Garrido (1), Amel Barich (1), Robert Anczkiewicz (2), Károly Hidas (1), and Manuel Jesús Román Alpiste (1)

(1) Instituto Andaluz de Ciencias de la Tierra, CSIC & UGR, Av. de las Palmeras 4, 18100 Armilla (Granada), Spain, (2) Instytut Nauk Geologicznych PAN, Polish Academy of Science, Senacka 1, 31-002 Kraków, Poland

Accessory minerals, such as zircon and monazite, likely constitute the most suitable geochronometers in crustal rocks at amphibolite- and granulite-facies conditions (e.g. Hermann and Rubatto, 2003). One of the main issues that prevent from establishing reliable P-T-t paths and associated geodynamic scenarios for high-grade crustal rocks, is the difficulty of relating zircon and monazite ages with the crystallization of the P-T dependent major mineral assemblages in the rock. A clear example of this are the contradictory geodynamic conclusions obtained by using U-Pb zircon and monazite geochronological studies on the age of metamorphism in basement rocks of the highest-grade Alpujárride units of the Betic Cordillera, and in particular the western Alpujárrides Jubrique unit (Sánchez-Rodríguez, 1998; Platt and Whitehouse, 1999; Montel et al., 2000; Whitehouse and Platt, 2003; Rossetti et al., 2010; Ruiz-Cruz and Sanz de Galdeano, 2014; Massonne, 2014). To shed light on this problematic, we present combined U-Pb zircon and monazite dating, and Lu-Hf dating of large garnet crystals in samples from thje porphyroclastic and porphyroblastic gneisses from the basal crustal sequence of Jubrique, and from garnet pyroxenites in the underlying Ronda peridotite massif (Sierra Bermeja) near the contact with the Jubrique unit. Based on these new Lu-Hf garnet geochronology data and previously published data on zircon and monazite ages, we discuss the age of metamorphism and associated geodynamic scenarios recorded in the gneisses, and the geological relationships between the crustal sequence and the underlying peridotite slab and their implications for the geodynamic evolution of the westermost Mediterranean.