

Timing of high-pressure metamorphism in the Nevado-Filabride Complex of the Betic Cordillera, Spain: implications for subduction in the Western Mediterranean

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The Betic Cordillera of southern Spain is an orogen formed in response to millions of years of convergence between Africa and Iberia, from the late Mesozoic to the present. The orogen consists of three main tectonic complexes, two of which have been subducted to depth, then exhumed back to the surface over short timescales. The timing of subduction and exhumation in the structurally higher of these complexes is relatively well constrained, but the timing of high-pressure metamorphism in the structurally lower complex, known as the Nevado-Filabride Complex, has been a topic of debate for several years due to conflicting geochronological data. Varying tectonic models have been proposed on the basis of conflicting dates to describe the history of the Nevado-Filabride Complex. Several models, based primarily on $^{40}\text{Ar}/^{39}\text{Ar}$ dating on white mica in high-pressure schists, require that the Nevado-Filabride and Alpujarride Complexes were coevally subjected to high-pressure metamorphism in the Eocene, and subsequently exhumed at different rates. But more recent models, based on Lu-Hf dating on prograde garnets in eclogites, separate the timing of subduction of the Nevado-Filabride Complex from its overlying tectonic unit by at least 10 m.y. We examine the viability of these models using multimineral Rb-Sr dating of blueschist and eclogite facies rocks in the Nevado-Filabride Complex. Our results will allow us to distinguish between the two conflicting tectonic models and to clarify the tectonic history of the Western Mediterranean.

Keywords: Spain, Nevado-Filabride Complex, high-pressure metamorphism, Rb-Sr.