



Differential exhumation of the Nevado-Filábride Complex (Betic Cordillera, Southern Spain): evidence from apatite (U-Th)/He thermochronology and apatite fission tracks

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New apatite (U-Th)/He, fission track data and thermal modelling from the Nevado-Filábride Complex in the Sierra Nevada and Sierra de los Filabres of southern Spain are used to constrain the Neogene exhumation history of the region. Apatite (U-Th)/He and fission track ages in Sierra Nevada are similar indicating that a rapid cooling event occurred at 8-6 Ma. This cooling event shows that the exhumation of the Upper Nevado-Filábride units in western Sierra Nevada was facilitated by the movement on the Mecina Detachment Fault. The western Sierra de los Filabres cooled rapidly at 12 Ma, while the central Sierra de los Filabres experienced a less dramatic cooling event at 8 Ma. The apatite (U-Th)/He and fission track age distribution in the Sierra de los Filabres can be explained with the exhumation of the Nevado-Filábride rocks according to the movement towards the southwest of the hanging wall of the Mecina Detachment Fault and the flexural uplift of the footwall. The lower cooling rates in the central Sierra de los Filabres suggest that folding and erosion were the main exhumation processes acting in that region during the Late Tortonian-Early Messinian.