



Preliminary thermochronological data on the tectonic evolution of the Bulgarian Rhodope

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The Rhodope Massif of southern Bulgaria–northern Greece is part of the Alpine–Himalayan orogenic system that displays a stack of Mesozoic, south-vergent thrust sheets. Oligocene–Miocene extension pervasively affected the early, convergent structures and reactivated the former thrust zones as low-angle detachment faults. This reactivation resulted in prominent core complexes such as the Central Rhodopian Dome.

This work provides new constraints on the low temperature history of the Central Rhodopian Dome (CRD). We conducted fission-track analyses on apatite minerals (AFT).

The apparent AFT ages for the CRD reveal different phases of cooling on the northern and on the southern sides of the dome. In the north, no significant jump in ages can be found across the detachment between core migmatites and hangingwall gneiss-marble sequences. This northern detachment has therefore been locked before these samples were cooled to temperatures less than 110°C, about 27 Ma ago. In the south, footwall samples all have a similar age of about 15 Ma. The detachment between the core migmatites and hangingwall eclogite-metabasic-gneiss sequences marks a jump in apatite ages to about 24 Ma in the hangingwall. This indicates that the southern detachment was active until at least 15 Ma. These ages indicate a protracted extension history from Oligocene to Miocene times. They point to the influence of the Miocene back-arc extension, which is well documented further south in the Aegean Sea. They further suggest that the Central Rhodopian Dome is either a multiphase metamorphic core complex or that it results from a strongly asymmetric system with extensional structures abandoned in the north while southern detachments were still

active in Miocene times.