



## **Thermochronologic evaluation of the Arabia-Anatolia collision: new results from Apatite (U-Th)He and Fission Track**

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To better understand the driving mechanisms behind the transition from collision to escape in a convergent plate tectonic setting, multiple low-temperature thermochronometers were used from the Arabia-Anatolia collisional belt. Within the accreted terranes of the Anatolian plate, Late Cretaceous and Eocene metamorphic and intrusive rocks were targeted to track regional and/or local exhumation patterns that may have occurred since collision initiated ~35-20 Ma. Forty-eight samples were collected in a ~200 km wide swath from the main Arabia-Anatolia suture, along and across three major fault zones: the East Anatolian Fault Zone (EAFZ), the Sürgü Fault, and the Central Anatolian Fault Zone (CAFZ). We report here both Apatite (U-Th)He (AHe) and Apatite Fission Track (AFT) analyses performed on the same samples. (1) From the EAFZ, two ~1200 m high vertical transects were sampled north and south of the main fault strand within the low-grade metamorphic rocks of the Pütürge Massif. Although a majority of apatite grains had extremely low uranium contents preventing acquisition of meaningful AHe ages, results from the few uranium-rich samples indicate ages ranging from 14 to 9 Ma in the northern flank of the EAFZ while the southern flank recorded younger exhumation around 5-3 Ma suggesting differential vertical displacement along the fault since ~10 Ma. In contrast, Zircon (U-Th)He results from both sides of the fault show comparable ages around 25-18 Ma. (2) Exposed in the vicinity of the dextral Sürgü Fault, Eocene granitic bodies from the Berit Mountains were sampled within 5 km south of the fault and over 500 m elevation. AHe results yield ages between 27 and 14 Ma. (3) Along the Ecemiş segment of the CAFZ, the Late Cretaceous Niğde metamorphic complex and its deformed Paleocene-Eocene sedimentary cover show AFT and AHe ages confined between 20 and 15 Ma implying fast cooling and exhumation at this time. Further south, the Eocene Horoz pluton that intruded the Tauride platform was sampled across a steeply incised valley. The AHe ages obtained range from ~16 Ma at 1900 m to ~9 Ma at 1000 m and suggest at least ~2 km of erosion since ~9 Ma which agrees with the presence of nearby Tortonian marine deposits at ~2 km elevation. Since the initiation of the Arabia-Anatolia collision regional exhumation patterns throughout the SE Anatolian plate track differential motion across major fault zones and widespread erosion associated with distributed deformation.