APATITE FISSION TRACK METHOD APPLIED TO THE DECIPHERING OF BASIN AND RANGE EXTENSIONAND OPENING OF THE GULF OF CALIFORNIA, MEXICO

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Tertiary Basin and Range extension and opening of the Gulf of California originate uplift, erosional and/or tectonic denudation in SW United States and NW Mexico. The fission-track record in apatite gives informations about the thermal history of the extensional belt and allows to constrain uplift and denudation chronology. We analyzed the fission track record from one sample of Proterozoic granite in the lower plate of the Metamorphic Core Complex (MCC) of Mazatán, 11 samples of Cretaceous-Tertiary plutonic rocks (Laramide batholith) along the eastern coast of the Gulf of California and three samples of the same batholith in the graben of Hermosillo. The Proterozoic granite below the detachment fault presents an apatite fission track age (FTA) of 18±1 Ma. This age is consistent with FTA of other MCC lower plates of the Basin and Range province. FTA in the Laramide batholith range from 36.6 Ma in Tiburon island to 5.9 Ma north of Bahia Kino, along the western coast of Sonora. The latter and ages of the Hermosillo area samples of 8.12±0.95 Ma and 9.19±0.67 Ma indicate that the Gulf of California opening had a broad influence in Sonora, until at least 120 km from the present coast, probably reactivating Basin and Range faults. To better constrain the thermotectonic history of this region, new FTA datations are in process in the lower plate of the Magdalena Metamorphic Core Complex, and along a 250 km-long E-W transect from the Gulf of California to the Sierra Madre Occidental.