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of the brittle lithosphere breaks off and sinks into the semi-viscous asthenosphere below, is a commonly proposed mechanism. While a wide array of geologic data, including geomorphic and geophysical data, supports modern-day lithospheric delamination as an uplift mechanism, the thermal history of the region remains poorly constrained. The thermal history of a region documents the time at which certain rocks experienced a specific temperature, and allows for geologists to draw interpretations about the development and erosion of mountains. Although both the low and high temperature history is known, a ~300 million year gap currently exists in the thermal record, precluding interpretations about the long term uplift and erosional history of the Appalachians. To bridge this gap, we applied zircon (U-Th)/He thermochronology, a mid-temperature geologic dating technique, to rocks from the Appalachian Mountains.

Thermochronology is employed to determine the thermal history of a region, which can uncover the uplift and erosional past of a mountain range. Thermochronology takes advantage of the natural radioactive decay of trace elements, such as uranium, found within specific mineral types. As uranium decays, it releases helium at a predictable rate into a mineral grain. Deep within the earth, where temperatures are es atc a