Text S2. Supplementary Discussion

Long-term erosion rates were combined using the method described in the supplementary section of Reiners et al. (2003), with additional refinement based on the availability of two dates for each grain and the presence of different populations due to the detrital origin of the apatites. Each apatite was assumed to represent a unique population initially, which lowers resolution but is a necessity imposed by the uncertain provenance of each grain (this technique may be further refined in the future by using U-Pb dating and other geochemical methods to isolate populations prior to thermochronology). Apatites are then compared by plotting (U-Th)/He age and fission-track age against one another, which allows grains representing analytically indistinguishable erosion histories to be grouped into populations. The overall precision of age measurements is not necessarily improved by the presence of larger populations when it cannot be guaranteed that these populations share precisely the same erosional histories. For this reason, it would be improper to report errors on population ages reported here.

Parameters necessary for erosion rate calculation based on thermochronometer ages are loosely constrained for the interior of East Antarctica due to a lack of high-precision data. However, we found that none of these parameters drastically affected the overall interpretation of extremely low erosion rates. The most influential variable affecting the result was the geothermal gradient g0, so we report a range of closure depths zc and resulting erosion rates ė for each system based on a liberal range of values for this parameter. Reasonable ranges of thermal diffusivity K and boundary depth L did not dramatically affect erosion rate calculations, so the default values of 30 km/myr and 40 km, respectively, from AGE2EDOT (Ehlers et al., 2005) were used.

The Dodson (1973) equation for Tc was used assuming the values for apatite activation energy Ea and diffusivity D0 reported by Farley (2000), allowing the final unknown ė to be calculated by assuming exhumation to be erosional and using the range of g0 extending from 20 to 30 °C/km.