

## **Fission tracks simulated by swift heavy ions at crustal pressures and temperatures**

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Using a new experimental approach, fission-track formation has been simulated, for the first time, under crustal conditions by exposing natural zircon, at a pressure of 7.5 kbar and a temperature of 250 °C, to a beam of relativistic heavy ions. The latent tracks were investigated using high-resolution transmission electron microscopy, and the diameters of several hundred tracks were measured. The mean values ( $\pm\sigma$ ) of the track diameters were  $5.2\pm 0.5$  nm and  $5.4\pm 0.4$  nm for zircon at ambient and elevated pressure-temperature, respectively. Based on the number of measurements, this represents a statistically significant difference between the tracks at ambient vs. high-pressure/temperature conditions. The slightly larger size of the tracks at elevated pressure can be understood in terms of the increased efficiency of the damage process in a strained crystal lattice. This slight variation in track diameter ( $\sim 0.2$  nm) at high pressure probably will not affect the dimensions of etched tracks.