Greenschist facies metamorphic zircon in a regional normal-sense shear zone, Brooks Range, Alaska

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Zircon is known to grow and react under a wide variety of metamorphic conditions. Characterizing mineral inclusion assemblages together with trace element and Hf-isotope chemistry can help constrain conditions of metamorphic zircon growth and permit association of U-Pb ages to structural and metamorphic fabrics. Late Aptian age (~114 Ma) metamorphic zircon overgrowths identified in various localities more than 200 km along strike within a normal-sense regional shear zone in the southern Brooks Range, AK, are characterized by low Th/U ratios, locally homogeneous εHf compositions, variably enriched or depleted HREE abundances, low Ti concentrations, an abundance of mineral inclusions (quartz, phengite, chlorite, paragonite, albite, epidote, titanite, apatite, xenotime), and are in turn overgrown by late stage albite porphyroblasts, thereby bracketing relative timing of zircon growth. U-Pb ages of zircon overgrowth thus provide a constraint on the timing of orogenic decompression that occurred subsequent to significant crustal shortening and blueschist metamorphism in the Brookian orogen.

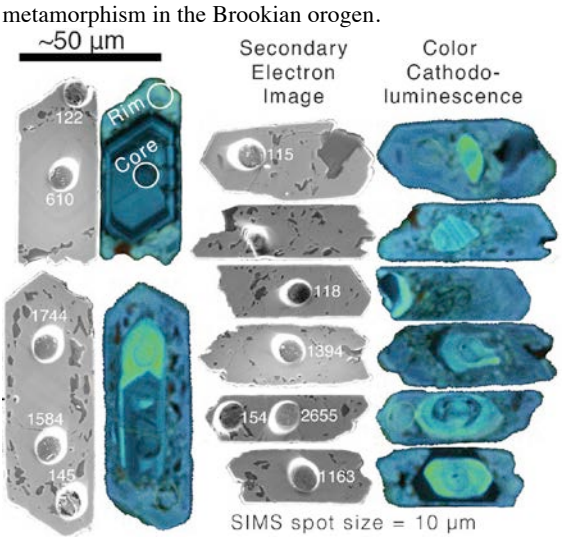

Figure 1. Representative zircon showing relict oscillatory-zoned cores of detrital origin overgrown by inclusion-rich zircon rims. U-Pb ages (Ma) shown adjacent NordSIM spots.