GSA Connects 2024 Meeting in Anaheim, California

Paper No. 47-1
Presentation Time: 8:00 AM-5:30 PM

U/PB ZIRCON DATING OF BASEMENT ROCKS IN THE EASTERN UINTA MOUNTAINS, UTAH SUGGESTS 2.7-2.3 GA DEPOSITION AND CA. 1.7 GA METAMORPHISM AT THE SOUTHERN MARGIN OF THE WYOMING PROVINCE

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The creation of Laurentia involved accretion of crustal fragments around a central portion of Archean crust, including the Wyoming Province. The southern boundary of the Wyoming Province, the Cheyenne belt, separates Archean rocks to the north from <1.8 Ga Paleoproterozoic rocks of the Yavapai/Mojavia blocks that were previously interpreted to have collided with the southern Wyoming Province at ~1.7 Ga. Though the location of the Cheyenne belt is well-known in southern Wyoming, its location farther west, such as in the Uinta Mountains of eastern Utah, is poorly known due to conflicting U/Pb zircon ages from basement rocks of the Red Creek Quartzite and the Owiyukuts Complex. Here, we present new U/Pb zircon ages from a quartzite and felsic orthogneiss of the Owiyukuts Complex near Beaver Creek and two quartzites and an amphibolite from the structurally overlying Red Creek Quartzite from Beaver Creek and Jesse Ewing Canyon. New maximum depositional ages of the quartzites span from ~2.67 Ga to ~2.32 Ga and agree with the relative structural positions hypothesized by prior workers on the basis of structural mapping and metamorphic grade. Results also suggest that the quartzite sediments came from sources dominated by ~2.7 Ga ages, with one quartzite sample yielding ages as young as ~2.3 Ga. Two quartzites, including from both the Owiyukuts Complex and Red Creek Quartzite, have distinctly zoned zircon rims on CL images that yield high-U/Th, ~1.75 Ga ages that we interpret to represent the timing of high-grade metamorphism. Substantial Pb loss precludes estimation of the crystallization age of the felsic orthogneiss. Finally, a coarsely crystalline amphibolite sill exposed at Beaver Creek lacks a significant foliation and yields an age of 1.68 Ga, which we interpret to post-date high-grade metamorphism and deformation. In summary, our results suggest that basement of the eastern Uinta Mountains is dominated by ~2.67-2.32 Ga metasedimentary rocks, which enjoyed high-grade metamorphism at ~1.75 Ga. Given their similarities with the southern Wyoming Province and Cheyenne belt, we interpret that basement rocks in the eastern Uintas define the southern boundary of the Wyoming Province and were metamorphosed as a consequence of collision of Paleoproterozoic blocks to the south at ~1.75 Ga.

Session No. 47--Booth# 229

T160. North American Cordilleran Margin Tectonic Framework: Paleozoic and Precambrian (Posters)
Sunday, 22 September 2024: 8:00 AM-5:30 PM

Hall D (Anaheim Convention Center)

Geological Society of America *Abstracts with Programs.* Vol. 56, No. 5
doi: 10.1130/abs/2024AM-404741

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