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**Utilizing U-Pb SHRIMP geochronology to constrain  
the timing of Paleoproterozoic magmatism:  
a case study from the Makkovik Province**

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The Makkovik Province of Labrador is considered part of a Paleoproterozoic accretionary belt that developed on the southern margin of the North Atlantic craton during the ca. 1.9–1.7 Ga Makkovikian–Ketilidian orogeny. The Aillik domain represents one of three domains that comprise the Makkovik province. Recent regional bedrock mapping has further defined the lithological units that occur within the Aillik domain. The Aillik domain largely comprises: (a) the Aillik Group (previously termed the Upper Aillik Group), a supracrustal assemblage consisting of metasedimentary and metavolcanic rocks;

and (b) abundant, syn- and post-deformation Paleoproterozoic intrusive suites that have intruded the Aillik Group. The Aillik Group comprises polydeformed, upper greenschist- to lower amphibolite-facies, bimodal volcanic rocks and sedimentary rocks. The Aillik Group is known to host abundant base-metal and uraniferous occurrences. Constraining the timing of formation of the Aillik Group is pivotal to unravelling the depositional, tectonic and metallogenic history of the area.

Geochronological studies of metamorphosed volcanic rocks are complicated due to several factors, including: inheritance of older grains, metamorphic overgrowth on igneous grains, and by the commonly aphanitic to fine grain size of volcanic rocks and consequently the small size of grains suitable for radiogenic dating. In-situ techniques that date microdomains within single grains, in conjunction with backscattered electron and cathodoluminescence imaging prior to analysis, can overcome many of these complications. U-Pb zircon geochronology via Sensitive High Resolution Microprobe (SHRIMP) analysis was carried out on felsic volcanic rocks from the Aillik Group. These data indicate that the associated volcanism was older and longer-lived than previously recognized in the area. Felsic volcanism is now determined to extend from 1883 to 1856 Ma, punctuated by synvolcanic hypabyssal intrusions. This range in ages indicates that the Aillik Group records felsic volcanism for at least 18 m.y. to possibly as long as 35 m.y.