$^{40}Ar/^{39}Ar$ thermochronology of the southeast Central Gneiss Belt, Grenville Province, Ontario

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As different minerals begin to retain Ar at distinct temperatures (i.e., the "closure" temperatures), $^{40}Ar/^{39}Ar$ dating of suites of minerals can be used to reconstruct the cooling history of rocks in ancient orogenic belts. This information furthers our understanding of tectonic processes by placing constraints on the timing and relative rates of uplift/erosion and is required to test tectonic models.

The Grenville Province, exposed from Georgian Bay, Ontario to southern Labrador, is generally accepted to represent the deeply eroded remains of a collisional mountain belt formed during the ca. 1.0 to 1.2 Ga Grenville Orogeny. During this event, magmatic arcs and/or continental terranes, represented in Ontario by the Central Metasedimentary Belt (CMB), were accreted to the pre-existing Laurentian Craton. The Central Gneiss Belt (CGB) represents the reworked Laurentian Craton and is separated from the CMB by the Central Metasedimentary Belt boundary thrust zones (CMBbtz), a major crustal-scale thrust belt. Previous studies have reported relatively uniform $^{40}Ar/^{39}Ar$ ages across the northern part of the CGB (in the Britt and Shawanaga domains); from these data, uniform, slow post-orogenic cooling has been inferred. This contrasts with data from rocks further to the north, in the Grenville Front Tectonic Zone, which have a two-stage cooling history with initial cooling occurring at a much higher rate. At present insufficient Ar data exist to constrain the cooling history for the southern margin of the CGB, which represents the footwall of the CMBbtz.

For this study, fourteen samples from within ~30 km of the northern margin of the CMBbtz were selected for dating. The samples complement a recent U/Pb study and include seven hornblende separates, four K-feldspars, and three biotite single grain samples. To date, analyses have been obtained from three K-feldspars. In the McClintock subdomain, K-feldspar age spectra show two-phase release patterns with the first phase attaining Ar closure at ~900 to 920 Ma and the second phase at ~800 to 825 Ma. A single-grain feldspar sample from just north of the CMBbtz in the Muskoka domain shows a single phase release pattern with a minimum age of ~800 Ma. These results are compatible with known structural/age differences in this part of the CGB. Additional data and interpretation will be presented.