Presentation Time: 6:00 PM

EVIDENCE FOR EXTENSIVE MELT-PRESENT DEFORMATION AND DISMEMBERING OF THE OVERLYING ALLOCHTHONOUS CRUST DURING LATE-GRENVILLIAN OROGENIC FLOW

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The Grenville Province in Canada is subdivided into an Allochthonous Belt (AB), composed of Mesoproterozoic peri-cratonic to exotic rocks accreted to Laurentia that were deformed during the Ottawan (1090-1020 Ma) phase of the Grenvillian Orogeny, and a Parautochthonous Belt (PB), composed of Laurentian cratonic rocks and its metasedimentary cover that were reworked during the Rigolet (1010-960 Ma) phase. Recent conceptual models consider the Grenville as a Long-Hot Orogen involving phases of various channel flow modes during the Ottawan phase, followed by orogenic collapse and foreland-directed brittle-ductile thrusting in the PB during the Rigolet phase. This study aims at testing these models along a transect through the PB in western Quebec, where few recent studies have been conducted despite good exposure.

Six late- to syn-deformation granitic pegmatites and leucosomes were collected from highly migmatitic PB gneisses and isolated, decameter-to kilometer scale gneisses previously considered as klippen of the largely eroded AB, that now overly parts of the PB.

LA-ICPMS U-Pb zircon geochronology yields weighted mean $^{207}Pb/^{206}Pb$ Rigolet ages between 967 ± 6 Ma - 1013 ± 10 Ma for all six samples, revealing extensive melt-deformation during the Rigolet phase. In one outcrop, a interconnected and continuous network of gneissosity-parallel Rigolet veins in the PB footwall are traced into dykes that brecciate the overlying mafic rocks of the AB. In other outcrops, Rigolet pegmatites crosscut blocks of coherent AB rocks surrounded by migmatitic PB, whereas others simply consist of mafic boudins hosted in PB rocks. Our trace-element geochemical comparisons of these mafic units indicate they form part of the overlying AB rather than mafic dykes that intruded the pre-Grenvillian Laurentian basement. We interpret these observations to represent a complete dismembering cycle of the mafic unit from incipient intrusion to complete incorporation.

These data indicate that these AB units, were not only intruded by Rigolet anatectic granite, but in places, were dismembered during deformation of the PB. Consequently, deformation of the PB in western Quebec may represent a mode of heterogenous ductile flow during the Rigolet phase of the orogeny that incorporated and dismembered part of the overlying AB.

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