



P-T-t paths across the New Quebec Orogen and relationships to tectonics

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The South-Eastern Churchill Province, accreted and deformed in a transpressional regime during the paleoproterozoic Trans-Hudson Orogeny, is among the best exposed products of possibly transitional tectonics between archaic and modern dynamics. Determining its past thermal state is key to the understanding of secular evolution of collision zones. The New Quebec Orogen (NQO) (1,82-1,77 Ga) is located on the western part of the province and results from the oblique collision between the Superior craton and the Core Zone (CZ), and involved the Rachel Laporte Zone (RLZ), a transition from a continental forearc to a collisional foreland basin. We present the results of an integrated approach applied on supracrustal rocks in the central segment of the orogen, investigated by petrography, phase equilibria modeling and petrochronology. A regional clockwise metamorphic evolution includes a peak at 655°C/6.9 kbar which is followed by an isobaric cooling within the RLZ. The estimate for the metamorphic peak in the CZ is 790°C and 7.2 kbar and follows an isothermal decompression. This restitic nature of granulites is coherent with the field observations evidencing systematic migmatization in the study area. Petrochronology yield ages for prograde metamorphic monazites in the RLZ at ca. 1796 Ma. At the same time, retrogression ages are documented within granulitic CZ at ca. 1807 Ma (retrograde monazite and zircon overgrowths) and ca. 1798 Ma (cooling age of rutile). Lu-Hf ages on garnet are in progress to estimate the age of prograde metamorphism. The continuous field gradient, the different PT paths and the diachronous metamorphism implying tectonic exhumation and thrusting of the CZ over the burying RLZ support the interpretation of a paleoproterozoic cryptic discontinuity. The results highlight significant burial of supracrustal sequences along a Barrovian gradient during the NQ orogeny, which is hardly compatible with the dominantly strike-slip movement of all major shear zones in the South-Eastern Churchill Province.