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Thermal structure of the Brooks Ranges and Seward Peninsula, Alaska HP-LT units : insights from RSCM thermometry

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Inner parts of mountain belts expose metamorphic rocks that record the thermal evolution of orogenic wedges, from burial to final exhumation. As such, they provide key constraints for paleogeographic and tectonic reconstructions of convergent zones. In order to understand the relationships between the Pacific subduction system and the Arctic geodynamics, we herein reappraise the key tectonic evolution of the Brooks Ranges (Northern Alaska). High-pressure low-temperature metamorphic rocks cropping out in the Schist belt of the Brooks Ranges, and the Nome Complex schists (Seward Peninsula), were exposed during Early Cretaceous to Paleocene times. Processes and structures responsible for their exhumation (i.e. syn-collisional nappe-stacking or post-collisional extensional detachment), which are still a matter of debate, have direct implications in terms of orogenic boundary conditions and mechanical coupling between subduction processes in southern Alaska and basin response to the north (North Slope). In this study systematic thermometry via Raman Spectrometry (RSCM) of Carbonaceous material along two regional transects in the Schist Belt and Seward Penisula (Nome area) allows the identification of units with contrasting thermal histories and a comparison of the thermal evolutions of the two areas. Geodynamic implications are finally discussed.