Geophysical Research Abstracts
Vol. 14, EGU2012-9609, 2012
EGU General Assembly 2012


# Detailed thermal fingerprinting of obduction-related processes: insights from Northern New Caledonia

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Northern New Caledonia comprises large and continuous units of high-pressure metamorphic rocks formed in response to the Eocene subduction of a continental margin, classically viewed as a northern extension of the Norfolk ridge, below an oceanic island–arc system (well-exposed in southern New Caledonia) [1, 2]. Metamorphic conditions increase gradually towards the east, providing a continuous window on prograde metamorphism from low-grade, lawsonite-bearing assemblages to epidote-bearing eclogite [3, 4, 5]. Unfortunately, available P-T constraints are mostly restricted to metamafics, but are almost completely lacking in metasediments, which represent the dominant lithology in these mainly continental-derived units. This is due both to the lack of diagnostic mineral assemblages in the metasedimentary lower grade units and to the intense late retrogression affecting the higher-grade metasediments.

We herein present an extensive thermometric dataset (encompassing the area from Hienghene to the south and from Koumac to Pouébo) obtained via Raman Spectroscopy of Carbonaceous Material (RSCM), which provides quantitative estimates of the peak metamorphic temperature of CM-bearing metasediments in the range ∼200-650°C [6, 7]. Metamorphic conditions vary from about 200 °C in the lower-grade units and progressively increase toward the east to about 550 °C in the eclogite facies unit. Sharp metamorphic gaps are nevertheless found across some major tectonic boundaries (such as the Gendarmerie fault zone). Importantly, the main metamorphic units defined by means of our dataset do not always match with previous studies. This dataset also provides useful insights on the architecture of the high-pressure belt in Northern New Caledonia, where structures are poorly exposed due to thick vegetation.

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