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New constraints on the Mae Ping core-complex NW-Thailand: Is the Mae-Ping an Indosinian (Triassic) relict?

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The Mae Ping fault zone is seen as one of the major strike-slip shear zones in SE-Asia and is trending NW-SE over 500 km across Thailand. Within this fault zone, a 150 km long and 5 km wide core-complex of ductile deformed amphibolite-facies rocks containing lenses of an older high-grade px-amph-pl paragenesis occurs. These so called Lan Sang Gneisses are named after the outcrops situated in the Lan Sang National Park. Despite several former investigations (Lacassin et al., 1997; Morley et al., 2012) some aspects concerning the time, regime and cause of exhumation remain unclear. Further on, the old relictic granulite-facies paragenesis has never been studied in detail. Older models constitute a restraining bend within a left-lateral regime as the origin of the exhumation of the Lan Sang Gneisses. New detailed structural, petrographical and geochronological investigations of the Lan Sang Gneisses were undertaken to develop different PTt-paths for different rock types within the Lan Sang Gneisses with special emphasis on the lenses of old high grade rocks which probably represent an older lower crust. We use detailed field investigations on a NE-SW profile following a river outcrop in Lan Sang National Park, zircon and monazite ages of three different rock types, structural and petrographical investigations on more than 100 thin sections and electron microprobe analyses and techniques such as geothermometers and -barometers. On the basis of our observations and measurements, we are able to reconstruct and quantify the different prograde and retrograde histories.
First results now strongly question the model of a restraining bend and lead us to the conclusion that the origin of the amphibolite-facies deformation may lie in the late Triassic Indosinian orogeny. If this is the case, the importance of the whole Mae-Ping for the lateral Extrusion of SE-Asia during the Himalayan orogeny must be questioned.