



Crustal flow in western Yunnan, China, and along the Mogok belt, Myanmar

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The mode of deformation along the eastern boundary of the northward moving Indian block during the Cenozoic is still controversial. Models considered are: (i) southward lateral extrusion of a single crustal block bounded by the right lateral Sagaing fault in Myanmar and the left-lateral Aialo-Shan shear zone (ASSZ) in Yunnan; (ii) southward lateral extrusion of at least two different crustal blocks between the right-lateral S(W)-striking Gaoligong Shan shear zone (GSSZ), the NW-trending Chong Shan shear zone (CSSZ), and the ASSZ. We present a radically different new model: the GSSZ and CSSZ constitute a folded sub-horizontal detachment separating the brittle upper crust from the middle-lower crust represented by the Mogok igneous and metamorphic belt. The kinematics of flow along the detachment was dominantly top-to-S. Folding of the detachment was coeval with and followed top-to-S flow. In the brittle crust, ~E-W shortening is expressed by a fold-thrust belt, and in the ductile crust by L>S tectonites. The deformation pattern is preliminary interpreted as reflecting gravitationally driven flow of upper crustal material from Tibet towards SE-Asia, reminiscent to what is observed by GPS geodesy today.

New Mogok-belt granitoid U-Pb zircon dates span the Early to Late Cretaceous (peaks at ~125; 115; 90, and 65 Ma) and tie the Mogok belt to the Gangdese arc of the Lhasa block. New Tertiary magmatic and metamorphic U-Pb zircon dates are 40-30 Ma, similar to magmatism observed across SE-Asia and similar to the monazite age of dikes that we interpret as pre-tectonic along CSSZ [1]. Published and new $^{40}\text{Ar}/^{39}\text{Ar}$ dates show that rapid cooling, that we relate to onset of high-strain deformation along the shear zones, started at 20-15 Ma [2, 3]. Fission-track and (U-Th)/He thermochronology indicates that its activity continued at least to 6-3 Ma.

References:

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