

# Crustal flow around the Eastern Himalayan Syntaxis in western Yunnan, China

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The mode of Cenozoic deformation along the eastern boundary of the northward moving Indian block is still controversial. Models considered are: (I) eastward flow of the lower crust accompanied by large-scale clockwise rotation and crustal thickening; (II) southward lateral extrusion of a single crustal block bounded by the right lateral Sagaing Fault in Myanmar and the left-lateral Ailao-Shan shear zone (ASSZ) in Yunnan; (III) southward lateral extrusion of at least two different crustal blocks between the right-lateral S(W)-striking Gaoligong Shan shear zone, the NW-trending Chong Shan shear zone (CSSZ), and the ASSZ.

We present a new model where the Gaoligong Shan and Chong Shan shear zones constitute a folded sub-horizontal detachment, separating the brittle upper crust from a metamorphic segment of the middle-lower crust, the Mogok belt. Kinematics of flow along the detachment was dominantly top-to-south. Folding of the detachment was coeval with and followed top-to-south flow. In the brittle crust, ~E-W shortening is expressed by a fold and 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 data 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 ages yield 40–30 Ma, similar to magmatism observed across SE-Asia and alike to the monazite age of dikes that we interpret as pre-tectonic along CSSZ [1]. Published and new <sup>40</sup>Ar/<sup>39</sup>Ar data show that rapid cooling started at 20–15 Ma [2, 3]. We explain these results as onset of the high-strain deformation along the shear zones. Fission-track and (U–Th)/He thermochronology indicates that its activity continued at least to 6–3 Ma.

Acknowledgment. Funded in the framework of the TIP project bundle of the DFG

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Keywords: crustal flow, Yunnan, fission track, cooling history