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[Rapid Erosion at the Tsangpo Knickpoint and Exhumation of Southeastern Tibet](#)

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AThe Tsangpo River flows east along the Indus-Tsangpo Suture Zone (ITSZ) into the eastern Himalayan syntaxis but then abruptly reverses direction across the Namche Barwa antiformal massif and turns southwest towards the foreland. Associated with the change in the Tsangpo's direction is a large knickpoint within the massif that displays a 2,000 m elevation change. The abrupt change in the direction of the river at the massif suggests a past capture event. One proposed origin for the Namche Barwa massif involves tectonic and erosional feedbacks which in turn may be linked to relatively recent capture of the Tsangpo River into the Brahmaputra system. In this model, the river is responsible for vigorous erosion that distorts local stress fields and focuses strain, thereby causing localized weakening of the crust and rock uplift. We have measured a suite of U-Th/He zircon and Ar-Ar mica and K-feldspar ages from around this region. The zircon helium ages range from only 0.22 Ma near this knickpoint to over 12 Ma at distal and higher-elevation locations. This zone extends across mapped

terrane and structures and it appears to define a regional-scale partial-retention zone (PRZ) with an inflection at  $\sim 3,000$  m elevation and 1-2 Ma in age. If additional data confirm the presence of this zircon PRZ, this inflection would suggest at least several kilometers of erosion within the past few million years, consistent with the capture of the Tsangpo and propagation of incision into the SE Tibetan plateau. Further work will be directed at determining whether this incision is a transient wave or is pinned by growth of the Namche Barwa antiform.

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