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Exhumation, sediment routing and the detrital record of orogenesis, Taiwan

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The Coastal Range of eastern Taiwan contains the earliest sedimentary archive of active, mountain building for the region. The sediments were deposited in a collisional basin adjacent to the developing accretionary wedge to the west during the Plio-Pleistocene. The depositional age of the sediments has been well constrained both from biostratigraphy and by magnetostratigraphy to be Plio-Pleistocene making the area an ideal location to undertake a detrital thermochronology study to investigate exhumation through time.

In this study we combine low temperature fission track thermochronology and higher temperature U-Pb dating of detrital zircons to reveal the history of the region pre- and syn-exhumation. The new chronometric data show that the sediment was derived primarily from south-east China and is thermally unreset by the collision of the Philippine Sea Plate with the passive China Margin.

Together the U-Pb and fission track data provide strong evidence that either the sediment was not directly sourced from the evolving Central Ranges to the east and that sediment routing was important, or that these sediments were original cover and that rapid exhumation is a more recent phenomenon preserved in younger sediments than sampled during this study.