



Taking the cover off – detrital dating in the Coastal Ranges, Taiwan.

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The Coastal Ranges of eastern Taiwan consist of Miocene arc-related volcanic rocks unconformably overlain by sediments of the Takangkou Formation. These sediments were deposited in a collisional basin adjacent to the developing accretionary wedge to the west, and so potentially contain the earliest record of the erosion associated with orogenesis. The depositional age of the sediments is well constrained both from biostratigraphy (Chi et al. 1981) and by magnetostratigraphy (Lee et al., 1986; Horng and Shea, 1996) to be Plio-Pleistocene (<3.6 Ma). The low temperature thermal history recorded by apatite and zircon fission track dating indicate that although the apatite data are reset due to burial, the zircon fission track data are not. Thus the zircon fission track grain ages contain information regarding the bedrock cover that was removed to the west and potentially information on exhumation of the Central Ranges.

Little is known regarding the provenance of the Takangkou Formation sediments of the Coastal Ranges. Here we present zircon fission track grain analyses on sediments from two profiles at Shuilien and Hsiukuluan. The data were collected using both the conventional external detector method for fission track analyses and by the newly evolving laser ablation ICPMS technique. Thus a comparison and validation of the latter method is possible.

Zircon grain ages are consistently older than the depositional age of the sediment and vary in age from late Pliocene to PreCambrian. Deconvolution of the data shows young Plio-Pleistocene grain age populations in the stratigraphically youngest units. The older populations are similar to those observed in the Hsueshan Range to the west

of the Central Ranges (Liu, 1988) suggesting that much of the cover was derived from pre-Tertiary granitic rocks of southern China.

References:

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