

An approach for estimating long-term (10^5 – 10^6 yr) incision rates of incised meandering river: A case in Totsukawa River, Kii Mountains

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One of the most common and reliable techniques for estimating long-term (10^5 – 10^6 yr) uplift rates in mountain areas in Japan is based on identification of chronologically constrained climatic terraces. However, application of this technique is limited to mountainous rivers along which fluvial terraces are distributed. To overcome this problem, we aim to develop an alternative technique to determine the emergent timing of paleo-riverbed sediments in abandoned river valley around cutoff spur formed by meandering incised river; we conducted a case study along the Totsukawa river, Kii Mountains. Post-IR IRSL dating of K-feldspar from burial paleo-riverbed sediments in the abandoned river valley at an elevation of ~210 m (with a relative height of 115 m above present river) and previous studies indicate the emergent of the paleo-riverbed sediments occurred at 280 ka to 125 ka. Based on the results, the incision rate is estimated to be 0.37–0.83 mm/yr. This incision rate is consistent with denudation rates on both timescales of 10^1 – 10^2 years and 10^6 – 10^7 years reported in Kii Mountains.

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