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# Control of erosion and incision dynamics on the luminescence (IRSL) apparent ages of fluvial terraces (Rangitikei River, New Zealand)

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Age overestimation is common when dating fluvial deposits using feldspar-based luminescence methods because of insufficient exposure of sedimentary particles to daylight prior to deposition and burial. Based on detailed luminescence analyses of samples from fluvial terraces in a high uplift rate setting, we provide field evidence for the role of incision rate in driving the proportion of grains that are bleached during fluvial transport, and the age overestimation of mean multiple-grain luminescence ages. Using single-grain post-infrared IR stimulation (pIRIR) ages of fluvial terraces of the Rangitikei River (RR) of New Zealand, we show that its incision was non-linear during the last ∼11 ka. We propose that this non-linear pattern corresponds to the recovery of a steady-state incision after a phase of delayed incision with regard to uplift because of incision inhibition during the formation of a major aggradation terrace. We show that this non-linear incision pattern controlled the magnitude of resetting of the luminescence signals of feldspar particles during their fluvial transport, resulting in a temporal pattern in luminescence age overestimation based on multiple-grain measurements that depends on incision dynamics.