

pIRIR ages of the marine-terrace deposits in the eastern Kanto Plain

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Potassium feldspar pIRIR (post-Infrared Infrared-Stimulated Luminescence) is characterized by a high saturation level and thus applicable for constraining depositional ages up to 500,000 years. Technical problems of the pIRIR dating include anomalous fading and residual doses, which lead to underestimate and overestimate of age, respectively. However, established methods of fading correction and residual doses determined for modern sediments have enabled routine application of the pIRIR dating. Here we document how many pIRIR ages refine chronology of marine-terrace deposits in the eastern Kanto Plain. The depositional succession identified in the marine terrace consists of marine and/or fluvial facies below + 20 m in elevation and overlying beach-shoreface facies. The beach-shoreface facies shows lateral variations; it is medium to fine sand overlain by fluvial to aeolian facies in the landward part while the seaward part is composed of gravelly sand with no fluvial and aeolian facies. Dose-recovery tests reveal that pIRIR measured at 225 °C after prior IRSL at 50 °C is appropriate for dating the deposits. Fading rates determined for individual samples are variable while their average value is considered appropriate for the correction as it leads to age correction consistent with the stratigraphy. pIRIR ages of the beach-shoreface facies are laterally variable; they are around 110 ka and 85–90 ka, corresponding to the MIS (Marine Isotope Stage) 5c and 5a, in the landward and seaward parts, respectively. These results are in contrast to previous correlation to the MIS 5e. Underlying marine facies are dated as 160–170 ka, the interstadial periods of the MIS 6d–e, as well as the MIS 5e and 7. The marine deposits in this area have never been correlated with the MIS 6d–e, but this is consistent with a relative sea-level curve that assumes the local uplift. This attempt exemplifies how the pIRIR dating refines knowledge of late Quaternary stratigraphy and geomorphology.

Keywords: Pleistocene, Sequence stratigraphy, Luminescence dating, Tectonics, Geomorphology