Feldspar pIRIR dating for defining glacial-interglacial depositional sequences in the Kanto Plain, eastern Japan

*Toru Tamura^{1,4}, Hiroko Okazaki², Hiroomi Nakazato³, Tomonori Naya¹, Rei Nakashima¹

1. Institute of Geology and Geoinformation Geological Survey of Japan, AIST, 2. Natural Hisory Museum and Institute, Chiba, 3. The National Agriculture and Food Research Organization, 4. Graduate School of Frontier Sciences, The University of Tokyo

Feldspar post-IR IRSL (pIRIR) protocol is virtually an exclusive method for constraining absolute chronology of siliciclastic depositional records from the Middle to Late Pleistocene. Nevertheless, since its advocacy in 2008, the potential of pIRIR application has not been explored much. pIRIR dating is expected effective for constraining coastal sequence stratigraphy in relation to the Pleistocene glacial sea-level changes, in which sea-level highstand marine deposits are bounded by unconformity and lowstand terrigenous deposits. We applied pIRIR_{50/290} dating to a 35-m-long sediment core (GS-HKT-1) obtained from the northeastern Kanto Plain, eastern Japan, to examine its efficacy for defining depositional sequences after Marine Isotope Stage (MIS) 9. The core GS-HKT-1 in ascending order consists of shallow-marine deposits not younger than MIS7, terrigenous and brackish deposits, and MIS 5e coastal regressive succession overlain by aeolian sand and loess. Sixteen fading-uncorrected pIRIR 50/290 ages clearly underestimated the shallow marine deposits. The fading rate determined for individual sample is characterized by a broad scatter, and, if used for the fading correction, leads to an inconsistent age sequence with the stratigraphy. In contrast the average fading rate corrects ages consistently with the stratigraphy and correlation of the coastal and shallow-marine deposits with the interglacial stages. The fading rate is generally associated with large errors and its accurate determination requires a large number of replications. Therefore as practiced here unless there are significant changes in sediment provenance the average fading rate is consider to better represent the value for the fading correction. Further application of pIRIR dating is expected to clarify the stratigraphic structure and thus tectonic history of the Kanto Plain, the largest Quaternary basin nearby the triple junction of the plate boundaries.

Keywords: Sedimentology, OSL dating, tectonics, glacial sea-level change, sequence stratigraphy