A contribution to late Middle Paleolithic chronology of the Levant: New luminescence ages for the Atlit Railway Bridge site, Coastal Plain, Israel

The Atlit Railway Bridge (ARB) prehistoric site is located on the northern coastal plain of Israel, within natural caves which formed in calcareous aeolianites (kurkar), perhaps during a high sea-stand. Flint artifacts belonging to the Levantine later Mousterian tradition and faunal remains were found embedded in the kurkar infill of two caves. The aeolianites in which the caves had developed were previously constrained by IRSL50 dating of feldspars to be older than the last interglacial highest sea-stand (Frechen M. et al., 2004; Chronology of Pleistocene sedimentary cycles in the Carmel Coastal Plain of Israel. Quaternary International 121, 1e52), providing a maximum age for the artifacts.

Samples for luminescence dating were collected from the infill of the two caves (II and III), from the same deposits as the archaeological finds. Both quartz and alkali feldspars (KF) were extracted and measured using four different luminescence signals: optically stimulated luminescence (blue OSL) and violet stimulated luminescence (VSL) on quartz; and the infrared stimulated luminescence (IRSL) post-IR-IR290 signal and the IR50 signal corrected for anomalous fading on KF. The ages obtained from analyses of the different minerals and signals mostly agree within errors. The new luminescence ages date the sediment infill in Caves III and II to ~90 ka and ~70 ka, respectively, indicating that hominin occupation of this locality is coeval with the nearby Skhul Cave and Layer B in Tabun Cave.