Supplementary Information

SUPPLEMENTARY METHODS

Thermoluminescence (TL) dating was conducted on quartz grains extracted from sediment samples under dim red illumination and prepared using standard procedures[1]. Aliquots composed of about 5000 grains were analysed using a dual-aliquot regenerative-dose protocol to isolate the light-sensitive red TL signal[2,3]. This required two aliquots of each sample. The first aliquot was used to determine the equivalent dose associated with the optically-inert (thermally reset) TL signal, which was isolated by bleaching the grains with >380 nm illumination for 1 hr before TL measurement. The second aliquot was used to estimate the equivalent dose associated with the light-sensitive TL signal. We achieved this by measuring the total TL signal and then subtracting the optically-inert TL signal, taking into account the equivalent dose and TL dose-response data obtained from the first aliquot. This protocol, described in detail elsewhere[3], accommodates any dose-response differences between the light-sensitive and optically-inert TL signals. Aliquots were cut-heated to 260°C at a heating rate of 5 K s^{-1} and then held at 260°C for 1000 s to minimise the unwanted TL from incandescence. The isothermal red TL emissions were detected by an Electron Tubes Ltd 9235QA photomultiplier tube fitted with Schott BG-39 and Kopp 2-63 filters. Equivalent doses were estimated from the 20–30 s interval of isothermal decay (which we found was sensitive to >380 nm illumination), using the final 160 s as background. Concentrations of ^{238}U, ^{232}Th (and their decay products) and ^{40}K in the sediment samples were measured by high-resolution gamma-ray spectrometry and converted to dose rates[4] (allowing for beta-dose attenuation and the sample water contents), and combined with estimates of the cosmic-ray dose rate[5] and internal dose rate (0.03 Gy kyr^{-1}). Ages obtained from the optically-inert TL signal represent the time since the grains were last exposed to a significant heating event (e.g., volcanic eruption), whereas age determinations from the light-sensitive TL signal indicate the time since the grains were last exposed to daylight. The latter ages are the most appropriate in the present context, as the samples contained reworked (not *in situ*) volcanic quartz. But we conservatively view the ages obtained from the light-sensitive TL signal as maximum ages for sediment deposition, because each aliquot consisted of a large number of grains and some of these are unlikely to have been fully bleached by >380 nm illumination at the time of burial.

SUPPLEMENTARY TABLE S1 TL dating information for the Liang Bua deposits [a].

Sample code	Sector / sample depth (cm)	Mineral / grain diameter (μm)	Total dose rate (Gy kyr^{-1})	Equivalent dose [b] (Gy)	TL age (kyr)
LBS7-46a	**VII** / 862	Quartz / 90–125	1.90 ± 0.08	78 ± 19	41 ± 10 [c]
b				385 ± 26	202 ± 16 [d]
LBS7-45a	**VII** / 935	Quartz / 90–125	2.78 ± 0.19	153 ± 21	55 ± 8 [c]
b				230 ± 10	83 ± 7 [d]

[a] All uncertainties listed at 68% confidence interval.
[b] Error term includes 2% systematic uncertainty associated with laboratory beta-source calibration.
[c] Determined from the light-sensitive red TL signal.
[d] Determined from the optically-inert (thermally reset) red TL signal.

SUPPLEMENTARY REFERENCES

1. Aitken, M.J. *Thermoluminescence Dating* (Academic Press, London, 1985).
2. Morwood, M.J. *et al.* Archaeology and age of a new hominin from Flores in eastern Indonesia. *Nature* **431**, 1087–1091 (2004).

3. Westaway, K.E. & Roberts, R.G. A dual-aliquot regenerative-dose protocol (DAP) for thermoluminescence (TL) dating of quartz sediments using the light-sensitive and isothermally-stimulated red emissions. *Quaternary Science Reviews* (in press).
4. Olley, J.M., Murray, A. & Roberts, R.G. The effects of disequilibria in the uranium and thorium decay chains on burial dose rates in fluvial sediments. *Quaternary Science Reviews* **15**, 751–760 (1996).
5. Prescott, J.R. & Hutton, J.T. Cosmic ray contributions to dose rates for luminescence and ESR dating: large depths and long-term time variations. *Radiation Measurements* **23**, 497–500 (1994).