

SINGLE ALIQUOT REGENERATION METHOD USING RISØ – OSL/TL SYSTEM

Luminescence Age Comprehensive Report

GeoLuminescence Dating Research Lab., Department of Geosciences, Baylor University, Waco, TX, USA

Field Basic Information:

Field number: HLI-1
 Sediment type: Aeolian Sediments
 Locality: Hulunbuir dune field, NE China
 Latitude: 48.45018°
 Longitude: 118.40381°
 Elevation: 712 m a.s.l.
 Depth: 2.23 ± 0.02 m

Dose Rate Information:

Uranium (U): 0.73 ± 0.01 ppm
 Thorium (Th): 2.77 ± 0.03 ppm
 Potassium (K): 2.71 ± 0.02 %
 Rubidium (Rb): 103 ± 1 ppm
 Water content: 15 ± 5 %
 Dose rate: 2.75499 ± 0.1403 mGy/yr
 Cosmic dose rate: 0.18588 ± 0.01859 mGy/yr
 Etching time: 80 min | with HF
 Dose rate conversion factors: Guérin2011
 Beta grain attenuation factors: Guérin2012-Q
 Beta etch attenuation factors: Brennan2003
 Uncertainty estimation method: Monte-Carlo simulation (repeats:1000)

Summary Table:

Lab No.	Depth (m)	Aliquots	Grain size (µm)	Equivalent dose (Gy)	OD (%)	U (ppm)	Th (ppm)	K (%)	Rb (ppm)	H ₂ O (%)	Cosmic dose (mGy/yr)	Dose Rate (mGy/yr)	CAM Age (year)
BG4285	2.23	39/42	150-250	28.77 ± 0.98	16 ± 2	0.73 ± 0.01	2.77 ± 0.03	2.71 ± 0.02	103 ± 1	15 ± 5	0.19 ± 0.02	2.75 ± 0.14	10445 ± 630

Submit date: 2017-11-30

Irradiation Date: 2019-06-24

Report finished at 6/28/2019 11:32:01 AM by Liang, Peng

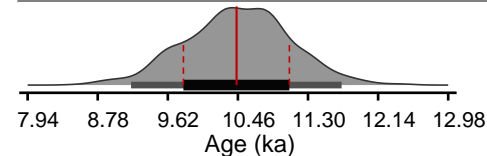
Equivalent Dose Information:

Lab number: BG4285
 Mineral used: Quartz
 Pre-heat temperature: 200 °C
 Cut-heat temperature: 220 °C
 Test Dose: 4.72 Gy
 Grain size fraction: 150-250 µm
 Aliquots used: 39/42
 Data/background: 1-2/75-100
 Plate diameter: 2 mm
 Overdispersion: 16 ± 2 %
 Age model used: Central Age Model
 Equivalent dose: 28.77 ± 0.98 Gy

Uncertainties analysis:

Luminescence measurements: 3.41 %
 Dose rate measurements: 5.09 %
 Total Age errors: 6.02 %

Final Age: 10445 ± 630 yr
 Asymmetric Age (1σ): [9805, 11075]



Submitter: Peng Liang

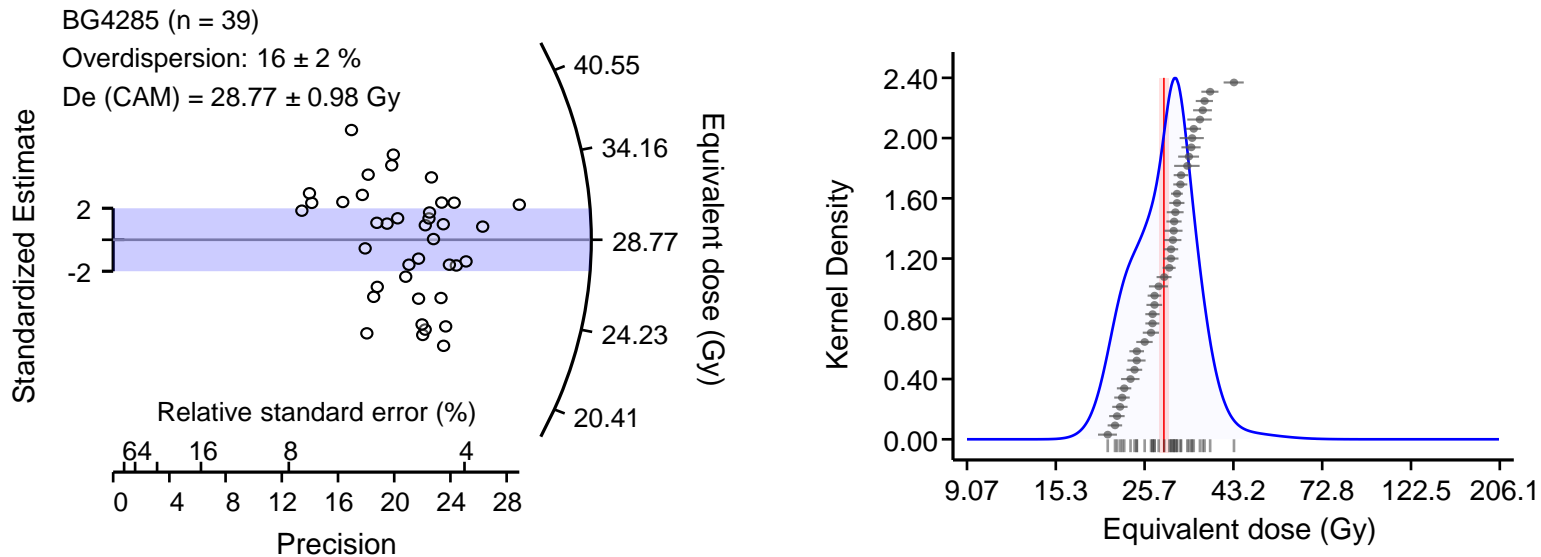
Analysist: Peng Liang

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Appendix Figures:



References:

- (1) Covers. Factors: Guérin, G., Mercier, N., Adamiec, G., 2011. Ancient TL 29, 5-8
- (2) β Grain Size: Guérin, G., Mercier, N., Nathan, R., Adamiec, C., Lefrais, Y., 2012. Radiation Measurements, 47, 778-785.
- (3) β Etch Depth: Brennan, B.J., 2003. Radiation Measurements, 37, 299-303.
- (4) α Grain Size: Brennan, B.J., Lyons, R.G. and Phillips, S.W., 1991. Part D. Nuclear Tracks and Radiation Measurements, 18, 249-253.
- (5) α Etch Depth: Bell, W.T., 1979. Ancient TL, 8, 1-12.
- (6) γ Dose Scaling: Aitken, M.J., 1985. Thermoluminescence dating. Academic Press, Orlando, Florida. P.289 Table H.1.

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