

Supplementary Materials: Burial and Exhumation History of the Lujing Uranium Ore Field, Zhuguangshan Complex, South China: Evidence from Low-Temperature Thermochronology

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Table 1. Detailed apatite fission track data of individual sample.

Sample ZG01, Apatite Fission-Track Length Data.								
ID	L _{App} (μm)	Dz (μm)	L _{True} (μm)	Azimuth	Dip	Angle	DPar (μm)	SD
Length01	11.1	0	11.1	21.31	0	21.31	1.86	0.07
Length02	11.02	0.82	11.05	76.97	4.25	77.01	1.92	0.04
Length03	13.39	0	13.39	32.23	0	32.23	1.92	0.04
Length04	13.68	3.27	14.07	20.08	13.45	24.01	1.72	0.14
Length05	13.36	1.64	13.46	61.96	6.98	62.18	1.96	0.06
Length06	12.35	0.82	12.38	75.89	3.79	75.92	1.96	0.06
Length07	15.6	0.82	15.62	80.76	3	80.77	1.96	0.06
Length08	10.9	3.27	11.38	78.72	16.71	79.2	1.96	0.06
Length09	13.06	4.09	13.68	87.28	17.39	87.41	1.96	0.06
Length10	9.38	9	13	83.26	43.82	85.14	1.96	0.06
Length11	13.01	3.27	13.41	49.52	14.12	50.98	1.67	0.19
Length12	14.66	0	14.66	63.41	0	63.41	1.82	0.16
Length13	15.83	0.49	15.83	62.57	1.78	62.58	1.63	0.08
Length14	11.3	1.96	11.47	57.05	9.85	57.6	1.53	0.12
Length15	13.11	0	13.11	55.5	0	55.5	1.68	0.07
Length16	10.18	5.4	11.52	38.11	27.94	45.97	1.68	0.07
Length17	15.33	3.93	15.82	89.48	14.37	89.5	1.56	0.07
Length18	11.48	5.89	12.91	25.12	27.15	36.33	1.56	0.07
Length19	13.75	0.98	13.78	88.63	4.08	88.63	1.56	0.07
Length20	12.5	1.96	12.65	18.77	8.93	20.72	1.56	0.07
Length21	12.21	0.49	12.22	73.44	2.3	73.45	1.61	0.14
Length22	11.47	4.42	12.29	42.35	21.06	46.4	1.58	0.11
Length23	13.78	0.98	13.82	69.48	4.07	69.53	1.58	0.11
Length24	12.35	4.91	13.29	71.8	21.67	73.12	1.41	0.06
Length25	14.44	2.94	14.74	51.58	11.53	52.49	1.41	0.06
Length26	13.89	0.98	13.93	69.47	4.04	69.52	1.73	0.13
Length27	13.19	0.98	13.23	73.64	4.26	73.69	1.73	0.13
Length28	14.15	0	14.15	30.89	0	30.89	1.57	0.05
Length29	14.57	3.44	14.97	80.1	13.27	80.37	1.57	0.05
Length30	15.33	0.49	15.34	22.22	1.83	22.29	1.57	0.07
Length31	13.91	1.96	14.05	56.36	8.03	56.74	1.64	0.12
Length32	13.75	3.93	14.3	38.06	15.93	40.79	1.64	0.12
Length33	14.22	2.94	14.53	80.37	11.7	80.58	1.64	0.12
Length34	10.27	0.49	10.28	58.2	2.74	58.24	1.66	0.06
Length35	10.97	0	10.97	41.95	0	41.95	1.44	0.07
Length36	14.54	0	14.54	76.1	0	76.1	1.54	0.05
Length37	13.16	0.98	13.2	80.59	4.27	80.61	1.54	0.05
Length38	13.06	3.44	13.51	69.1	14.74	69.81	1.54	0.05
Length39	13.2	0.49	13.21	80.42	2.13	80.43	1.54	0.05
Length40	14.51	4.91	15.32	83.74	18.69	84.07	1.54	0.05
Length41	13.71	0	13.71	61.81	0	61.81	1.75	0.08

Length42	13.64	0	13.64	48.25	0	48.25	1.73	0.11
Length43	13.59	0.49	13.6	57.35	2.07	57.37	1.73	0.11
Length44	12.35	2.45	12.6	45.44	11.23	46.51	1.53	0.06
Length45	13.04	2.94	13.37	80.15	12.72	80.4	1.78	0.15
Length46	9.94	0	9.94	57.65	0	57.65	1.55	0.04
Length47	13.85	0.49	13.86	83.34	2.03	83.34	1.55	0.04
Length48	13.67	0	13.67	39.48	0	39.48	1.49	0.08
Length49	11.9	0.49	11.91	31.32	2.36	31.4	1.4	0.08
Length50	12.56	1.96	12.71	34.89	8.88	35.86	1.67	0.09
Length51	12.4	2.45	12.64	82.1	11.19	82.25	1.67	0.09
Length52	12.22	0.49	12.23	75.79	2.3	75.8	1.62	0.11
Length53	13.55	0.49	13.56	45.85	2.07	45.89	1.62	0.07
Length54	11.21	0.98	11.25	83.09	5	83.11	1.5	0.06
Length55	13.55	0.49	13.56	52.47	2.07	52.5	1.5	0.06
Length56	14.14	0.98	14.17	49.41	3.97	49.53	1.51	0.07
Length57	15.72	0.49	15.73	60.5	1.79	60.52	1.48	0.04
Length58	11.57	2.94	11.94	64.43	14.28	65.27	1.48	0.04
Length59	16.3	0.98	16.33	45.68	3.45	45.78	1.67	0.05
Length60	12.93	0	12.93	75.44	0	75.44	1.44	0.13
Length61	14.33	0.98	14.37	44.22	3.92	44.35	1.44	0.08
Length62	13.53	2.94	13.84	88.25	12.28	88.29	1.44	0.08
Length63	14.12	1.96	14.25	83.58	7.92	83.64	1.63	0.07
Length64	13.83	0.49	13.84	60.73	2.03	60.75	1.63	0.07
Length65	14.58	0	14.58	28.95	0	28.95	1.66	0.14
Length66	14.44	0	14.44	76.86	0	76.86	1.66	0.14
Length67	13.82	1.47	13.9	70.86	6.08	70.97	1.66	0.14
Length68	13.1	0	13.1	68.77	0	68.77	1.66	0.14
Length69	13.28	0.49	13.29	69.88	2.12	69.89	1.66	0.14
Length70	13.61	0.98	13.64	64.12	4.13	64.19	1.66	0.14
Length71	12.94	1.47	13.03	63.33	6.49	63.51	1.6	0.12
Length72	9.4	1.96	9.61	66.23	11.79	66.76	1.68	0.09
Length73	13.2	2.94	13.52	83.95	12.58	84.1	1.68	0.09
Length74	10.03	1.96	10.22	15.7	11.08	19.14	1.68	0.09
Length75	10.56	0	10.56	51.55	0	51.55	1.68	0.09
Length76	10.58	3.93	11.29	49.75	20.36	52.71	1.79	0.1
Length77	11.92	2.45	12.17	67.45	11.63	67.94	1.63	0.08
Length78	13	1.96	13.15	67.56	8.59	67.82	1.46	0.08
Length79	13.35	5.4	14.4	43.02	22.01	47.33	1.46	0.08
Length80	13.73	0	13.73	52.57	0	52.57	1.46	0.08
Length81	9.57	1.96	9.77	70.05	11.59	70.47	1.46	0.08
Length82	13.46	0.98	13.5	77.76	4.17	77.8	1.46	0.08
Length83	12.66	0.98	12.7	43.81	4.43	43.99	1.66	0.03
Length84	13.11	1.47	13.2	51.67	6.41	51.95	1.66	0.03

Sample ZG01, Apatite Fission-Track Age Data

No.	Ns	Area (10 ⁻⁵ cm ²)	Qs (10 ⁵ cm ⁻²)	²³⁸ U (ppm)	1σ	Dpar (μm)	Age (Ma)	1σ	Length (μm)	N
1	50	5.77	8.67	23.20	1.40	1.86 ± 0.07	74.36	11.43	0–1	0
2	61	6.28	9.71	46.00	3.50	1.77 ± 0.08	42.10	6.27	1–2	0
3	25	4.59	5.45	27.60	1.40	1.69 ± 0.12	39.40	8.13	2–3	0
4	101	8.74	11.56	45.70	1.80	1.90 ± 0.09	50.42	5.40	3–4	0
5	35	5.60	6.26	19.50	1.20	1.74 ± 0.17	63.92	11.50	4–5	0
6	26	6.57	3.96	11.04	0.77	1.98 ± 0.10	71.37	14.86	5–6	0
7	60	8.55	7.01	23.80	1.50	1.65 ± 0.15	58.71	8.43	6–7	0

8	73	4.02	18.16	85.70	4.10	1.75 ± 0.16	42.27	5.34	7–8	0
9	45	5.11	8.82	26.40	1.50	1.65 ± 0.17	66.48	10.61	8–9	0
10	4	5.82	0.69	2.68	0.34	1.63 ± 0.26	51.13	26.38	9–10	3
11	13	3.95	3.29	9.30	0.64	1.64 ± 0.14	70.43	20.13	10–11	4
12	4	5.44	0.74	1.57	0.20	1.87 ± 0.16	93.14	48.06	11–12	9
13	55	4.39	12.54	39.40	2.40	1.83 ± 0.14	63.38	9.38	12–13	12
14	41	3.76	10.92	50.00	2.80	1.83 ± 0.14	43.56	7.23	13–14	34
15	14	2.96	4.74	24.90	1.70	1.72 ± 0.14	37.97	10.47	14–15	15
16	36	2.98	12.09	44.90	2.60	2.01 ± 0.07	53.66	9.47	15–16	6
17	41	2.51	16.31	46.50	2.90	1.67 ± 0.19	69.81	11.74	16–17	1
18	16	2.04	7.85	27.10	1.80	1.78 ± 0.14	57.70	14.93	17–18	0
19	18	2.19	8.24	24.00	1.50	1.65 ± 0.24	68.34	16.66	18–19	0
20	44	3.17	13.89	39.60	2.10	1.61 ± 0.19	69.81	11.16	19–20	0
21	2	2.69	0.75	2.42	0.25	1.77 ± 0.13	61.30	43.80	MTL = 13.21	
22	70	8.01	8.74	26.10	1.40	1.79 ± 0.10	66.64	8.73	Var = 0.16	
23	12	4.42	2.72	9.41	0.75	1.66 ± 0.17	57.55	17.23	SD = 1.44	
24	4	4.75	0.84	2.48	0.29	1.61 ± 0.16	67.58	34.70	N = 84	
25	55	6.28	8.77	30.00	1.70	1.82 ± 0.16	58.21	8.51		
26	6	2.88	2.08	5.80	0.53	1.64 ± 0.14	71.47	29.90		
911		123.4	7.49	26.73	19.57	1.75 ± 0.11				

Pooled Age = 55.6 ± 2.5 Ma

Central Age = 57.3 ± 2.6 Ma

Sample ZG07, Apatite Fission-Track Length Data.

ID	L _{App} (μm)	Dz (μm)	L _{True} (μm)	Azimuth	Dip	Angle	DPar (μm)	SD
Length01	13.92	1.47	14	71.73	6.04	71.84	1.56	0.13
Length02	12.18	0	12.18	50.33	0	50.33	1.56	0.13
Length03	14.64	1.96	14.77	26.55	7.64	27.55	1.6	0.19
Length04	12.03	0	12.03	71.75	0	71.75	1.61	0.08
Length05	13.41	0	13.41	21.63	0	21.63	1.43	0.07
Length06	12.16	0.98	12.19	44.47	4.62	44.66	1.43	0.07
Length07	13.25	0	13.25	73.08	0	73.08	1.44	0.17
Length08	14.83	0	14.83	87.14	0	87.14	1.72	0.13
Length09	15.3	0.49	15.31	75.52	1.84	75.52	1.72	0.13
Length10	12.94	0.49	12.95	72.3	2.17	72.32	1.68	0.11
Length11	15.71	0	15.71	69.2	0	69.2	1.25	0.1
Length12	15.1	0	15.1	63.36	0	63.36	1.25	0.1
Length13	15.3	0.49	15.31	31.41	1.84	31.46	1.55	0.09
Length14	12.8	0.98	12.83	45.88	4.39	46.04	1.51	0.11
Length15	13.42	1.96	13.56	71.06	8.33	71.27	1.44	0.09
Length16	13.13	0.49	13.14	32	2.14	32.07	1.44	0.09
Length17	13.45	2.94	13.77	69.31	12.35	69.81	1.54	0.04
Length18	13.24	0	13.24	66.18	0	66.18	1.56	0.07
Length19	13.24	0.49	13.24	60.86	2.12	60.88	1.6	0.16
Length20	15.33	1.47	15.4	11.18	5.48	12.43	1.6	0.16
Length21	12.75	0	12.75	69.99	0	69.99	1.6	0.16
Length22	11.49	2.45	11.75	54.82	12.06	55.71	1.59	0.07
Length23	13.04	3.44	13.48	72.09	14.76	72.71	1.59	0.07
Length24	13.24	2.94	13.56	58.33	12.54	59.17	1.73	0.19
Length25	13.47	0.98	13.51	87.21	4.17	87.22	1.5	0.04
Length26	11.83	0.49	11.84	68.88	2.38	68.9	1.68	0.19
Length27	14.34	0	14.34	34.4	0	34.4	1.7	0.16

Length28	11.14	3.44	11.66	31.8	17.14	35.7	1.7	0.16
Length29	12.38	0.98	12.42	38.17	4.53	38.39	1.66	0.21
Length30	13.03	1.96	13.18	58.18	8.57	58.57	1.6	0.11
Length31	14.32	0	14.32	44.01	0	44.01	1.78	0.1
Length32	12.06	0	12.06	65.48	0	65.48	1.74	0.11
Length33	14.42	0	14.42	74.89	0	74.89	1.74	0.11
Length34	13.79	0	13.79	73.67	0	73.67	1.74	0.11
Length35	11.75	2.94	12.12	79.8	14.07	80.11	1.74	0.11
Length36	9.7	0	9.7	9.69	0	9.69	1.62	0.15
Length37	17.11	0.98	17.14	82.59	3.28	82.6	1.76	0.04
Length38	13.8	0	13.8	65.11	0	65.11	1.74	0.1
Length39	14.61	1.47	14.69	48.67	5.75	48.92	1.44	0.06
Length40	11.6	0.49	11.61	75.84	2.42	75.85	1.56	0.1
Length41	12.66	0.49	12.67	24.47	2.22	24.56	1.5	0.09
Length42	13.9	0	13.9	79.24	0	79.24	1.5	0.09
Length43	9.59	0	9.59	78.87	0	78.87	1.6	0.13
Length44	12.8	0.49	12.81	67.66	2.2	67.68	1.64	0.18
Length45	11.13	0	11.13	31.47	0	31.47	1.64	0.18
Length46	13.39	0	13.39	46.99	0	46.99	1.64	0.18
Length47	13.34	0	13.34	41.91	0	41.91	1.64	0.18
Length48	10.04	6.87	12.17	5.91	34.39	34.83	1.64	0.18
Length49	14.63	0.98	14.66	47.27	3.84	47.38	1.64	0.07
Length50	13.31	1.47	13.4	72.17	6.31	72.28	1.64	0.07
Length51	13.36	0	13.36	70.51	0	70.51	1.85	0.16
Length52	14.44	0	14.44	12.05	0	12.05	1.85	0.16
Length53	14.42	0	14.42	2.13	0	2.13	1.85	0.16
Length54	14.53	2.94	14.83	42.2	11.46	43.44	1.85	0.16
Length55	14.19	1.96	14.32	81.72	7.88	81.8	1.85	0.16
Length56	11.74	0	11.74	16.35	0	16.35	1.75	0.05
Length57	13.38	0.98	13.41	71.43	4.2	71.48	1.72	0.05
Length58	12.72	0.98	12.75	49.48	4.41	49.63	1.72	0.05
Length59	13.94	1.96	14.08	75.14	8.02	75.28	1.72	0.07
Length60	10.44	0.98	10.49	82.72	5.37	82.75	1.7	0.1
Length61	13.21	0	13.21	29.98	0	29.98	1.7	0.1
Length62	14.02	1.96	14.16	66.17	7.97	66.41	1.63	0.05
Length63	13.99	0	13.99	46.83	0	46.83	1.63	0.05
Length64	10.24	0	10.24	78.35	0	78.35	1.39	0.1
Length65	13.68	0	13.68	64.68	0	64.68	1.8	0.09
Length66	10.35	1.47	10.46	49.92	8.09	50.4	1.67	0.17
Length67	13.68	0.98	13.71	47.82	4.1	47.95	1.6	0.12
Length68	13.28	0	13.28	44.44	0	44.44	1.7	0.07
Length69	14.31	3.93	14.84	47.95	15.34	49.77	1.47	0.12
Length70	13.68	3.93	14.24	85.31	16.01	85.49	1.57	0.12
Length71	14.61	1.96	14.74	62.15	7.65	62.42	1.69	0.17
Length72	11.59	2.45	11.85	73.36	11.95	73.73	1.64	0.14
Length73	14.7	1.47	14.77	55.94	5.72	56.14	1.59	0.11
Length74	13.58	0	13.58	87.42	0	87.42	1.63	0.05
Length75	13.74	2.45	13.96	89.02	10.12	89.03	1.73	0.08
Length76	12.99	1.96	13.14	48.76	8.59	49.32	1.78	0.12
Length77	14.42	0.49	14.43	48.19	1.95	48.22	1.62	0.05
Length78	14.42	0	14.42	32.36	0	32.36	1.62	0.05
Length79	13.02	0.49	13.03	81.69	2.16	81.69	1.59	0.07
Length80	14.37	0	14.37	53.41	0	53.41	1.65	0.1

Length81	13.1	0	13.1	44.35	0	44.35	1.6	0.11
Length82	14.49	1.96	14.63	82.65	7.71	82.71	1.65	0.08
Length83	14.64	1.47	14.71	36.85	5.74	37.23	1.57	0.08
Length84	15.81	0	15.81	38.63	0	38.63	1.57	0.08
Length85	14.01	1.96	14.15	48.89	7.97	49.37	1.74	0.11
Length86	12.66	0.98	12.7	60.26	4.43	60.36	1.74	0.11
Length87	11.34	0.98	11.38	24.41	4.95	24.88	1.76	0.13
Length88	12.23	3.44	12.7	78.59	15.69	79.02	1.66	0.1
Length89	10.85	2.45	11.13	69.62	12.74	70.15	1.79	0.17
Length90	16.1	0.98	16.12	40.14	3.49	40.26	1.72	0.12
Length91	10.6	4.42	11.49	76.77	22.61	77.81	1.63	0.08
Length92	10.7	0.98	10.74	29.7	5.24	30.12	1.68	0.22
Length93	12.79	0.49	12.8	56.46	2.2	56.49	1.8	0.05
Length94	13.87	2.45	14.08	83.48	10.04	83.58	1.61	0.08
Length95	12.7	1.47	12.79	77.5	6.61	77.59	1.78	0.18
Length96	12.95	0.98	12.99	42.94	4.33	43.12	1.62	0.12
Length97	14	3.93	14.54	53.28	15.67	54.85	1.67	0.19
Length98	11.84	2.45	12.09	88.12	11.71	88.16	1.72	0.06
Length99	13.99	2.45	14.2	28.16	9.95	29.73	1.72	0.06
Length100	14.39	1.47	14.46	75.74	5.84	75.82	1.65	0.08
Length101	12.88	1.47	12.97	51.57	6.52	51.86	1.65	0.08
Length102	14.19	1.47	14.26	52.45	5.93	52.68	1.72	0.1

Sample ZG07, Apatite Fission-Track Age Data

No.	Ns	Area (10 ⁻⁵ cm ²)	Qs (10 ⁵ cm ⁻²)	²³⁸ U (ppm)	1σ	Dpar (μm)	Age (Ma)	1σ	Length (μm)	N
1	42	2.94	14.27	62.30	4.30	1.68 ± 0.10	45.68	7.72	0–1	0
2	43	2.57	16.75	73.00	4.60	1.86 ± 0.04	45.76	7.55	1–2	0
3	24	2.34	10.26	43.60	2.70	1.75 ± 0.11	46.92	10.01	2–3	0
4	37	1.56	23.75	83.10	4.90	1.70 ± 0.04	56.94	9.95	3–4	0
5	29	2.10	13.85	56.70	5.20	1.62 ± 0.09	48.70	10.09	4–5	0
6	12	3.83	3.131	12.60	1.00	1.75 ± 0.09	49.54	14.83	5–6	0
7	19	2.56	7.555	30.30	1.70	1.76 ± 0.10	49.71	11.74	6–7	0
8	156	9.89	15.77	42.30	2.80	1.78 ± 0.12	74.18	7.71	7–8	0
9	46	3.63	12.67	54.90	3.40	1.79 ± 0.06	46.02	7.36	8–9	0
10	48	3.62	13.26	41.10	2.80	1.67 ± 0.15	64.24	10.25	9–10	2
11	30	2.52	11.92	38.90	2.20	1.72 ± 0.20	61.03	11.67	10–11	4
12	63	3.06	20.59	75.90	4.40	1.81 ± 0.07	54.06	7.50	11–12	10
13	4	3.11	1.285	3.53	0.33	1.75 ± 0.08	72.44	36.85	12–13	20
14	13	1.75	7.445	23.20	1.30	1.82 ± 0.16	63.90	18.08	13–14	29
15	34	3.75	9.078	26.80	2.20	1.77 ± 0.18	67.43	12.82	14–15	29
16	54	4.67	11.55	48.30	3.00	1.82 ± 0.09	47.68	7.13	15–16	6
17	24	8.25	2.909	7.69	0.61	1.59 ± 0.12	75.26	16.48	16–17	1
18	9	3.95	2.278	9.41	0.53	1.69 ± 0.21	48.26	16.32	17–18	1
19	39	4.06	9.613	32.00	1.70	1.71 ± 0.12	59.84	10.10	18–19	0
20	8	1.49	5.383	16.90	1.30	1.77 ± 0.09	63.43	22.95	19–20	0
21	36	2.99	12.06	41.50	2.50	1.62 ± 0.10	57.89	10.26	MTL = 13.36	
22	44	4.27	10.31	42.50	3.10	1.73 ± 0.10	48.36	8.10	Var = 0.14	
23	30	3.83	7.836	27.10	1.70	1.84 ± 0.04	57.61	11.12	SD = 1.39	
24	32	2.59	12.37	52.00	2.80	1.79 ± 0.07	47.43	8.76	N = 102	
25	77	3.78	20.35	53.50	3.00	1.87 ± 0.04	75.67	9.61		
26	29	3.95	7.351	20.90	1.50	1.72 ± 0.16	70.01	13.94		
27	17	2.66	6.390	20.50	1.30	1.75 ± 0.08	62.08	15.56		

28	30	3.72	8.064	31.50	2.00	1.71 ± 0.08	51.03	9.86
29	38	3.98	9.551	23.60	1.50	1.74 ± 0.16	80.48	14.02
30	86	7.68	11.20	37.40	2.30	1.65 ± 0.07	59.65	7.41
31	36	2.00	17.98	54.20	4.40	1.66 ± 0.06	66.05	12.24
32	63	3.74	16.83	46.60	2.60	1.68 ± 0.10	71.87	9.90
33	11	1.00	11.00	45.00	2.40	1.81 ± 0.11	48.73	14.92
34	56	4.12	13.49	53.10	3.00	1.85 ± 0.16	50.64	7.35
35	33	2.34	13.79	48.60	3.10	1.60 ± 0.12	56.53	10.48
36	33	2.58	12.81	48.50	2.80	1.77 ± 0.07	52.64	9.65
1385		126.9	11.24	39.70	19.06	1.74 ± 0.07		

Pooled Age = 58.1 ± 1.7 Ma

Central Age = 58.1 ± 1.9 Ma

Sample ZG08, Apatite Fission-Track Length Data.

ID	L _{App} (μm)	Dz (μm)	L _{True} (μm)	Azimuth	Dip	Angle	DPar (μm)	SD
Length01	12.34	1.96	12.5	53.97	9.04	54.48	1.71	0.05
Length02	15.58	1.47	15.65	45.09	5.4	45.35	1.64	0.06
Length03	9.45	0	9.45	57.86	0	57.86	1.75	0.07
Length04	14.36	2.45	14.57	50.94	9.69	51.6	1.75	0.07
Length05	9.41	0	9.41	35.36	0	35.36	1.75	0.07
Length06	14.69	0	14.69	79.05	0	79.05	1.77	0.22
Length07	14.03	0	14.03	40.48	0	40.48	1.77	0.22
Length08	13.44	0	13.44	70.82	0	70.82	1.74	0.09
Length09	11.5	1.47	11.59	44.94	7.3	45.4	1.77	0.1
Length10	11.48	0.98	11.53	79.95	4.89	79.99	1.72	0.05
Length11	11.47	1.96	11.64	74.22	9.71	74.45	1.72	0.05
Length12	11.53	0	11.53	71.58	0	71.58	1.78	0.02
Length13	13.97	1.47	14.05	53.01	6.02	53.25	1.76	0.28
Length14	11.76	1.96	11.93	28.21	9.48	29.63	1.76	0.28
Length15	14.81	0.98	14.84	36.21	3.79	36.39	1.76	0.28
Length16	12.06	0.49	12.07	4.04	2.33	4.67	1.82	0.07
Length17	14.37	2.45	14.58	51.32	9.69	51.97	1.82	0.07
Length18	15.09	0	15.09	55.53	0	55.53	1.82	0.07
Length19	11.87	1.96	12.03	30.38	9.39	31.66	1.71	0.11
Length20	15.5	0.98	15.53	56.09	3.62	56.17	1.79	0.1
Length21	14.86	1.96	14.99	72.97	7.52	73.12	1.56	0.08
Length22	13.58	0.49	13.59	55.87	2.07	55.9	1.7	0.1
Length23	13.27	1.47	13.35	63.16	6.33	63.33	1.63	0.12
Length24	12.05	0.98	12.09	68.75	4.66	68.82	1.63	0.12
Length25	12.67	0.49	12.68	62.69	2.22	62.71	1.71	0.08
Length26	9.95	0	9.95	83.71	0	83.71	1.71	0.09
Length27	16.03	0.49	16.03	13.77	1.75	13.88	1.66	0.06
Length28	12.53	0.49	12.54	60.11	2.24	60.14	1.67	0.15
Length29	14.19	0	14.19	63.28	0	63.28	1.62	0.15
Length30	10.51	0	10.51	60.67	0	60.67	1.59	0.07
Length31	15.26	0.98	15.3	55.35	3.68	55.43	1.64	0.1
Length32	14.58	0.49	14.59	34.07	1.93	34.11	1.64	0.1
Length33	15.65	1.96	15.77	34.42	7.15	35.07	1.64	0.1
Length34	14.58	0.98	14.61	59.94	3.85	60.01	1.64	0.1
Length35	15.15	0.98	15.18	40.92	3.71	41.06	1.64	0.1
Length36	12.89	0.49	12.9	80.39	2.18	80.4	1.64	0.1
Length37	13.15	0	13.15	9.58	0	9.58	1.69	0.11

Length38	13.03	4.42	13.76	58.56	18.73	60.4	1.69	0.11
Length39	13.97	1.96	14.11	77.27	8	77.4	1.7	0.1
Length40	11.1	0.98	11.14	6.94	5.05	8.58	1.7	0.1
Length41	15.84	0.98	15.87	25.92	3.55	26.15	1.75	0.11
Length42	11.71	0	11.71	45.96	0	45.96	1.75	0.11
Length43	11.25	0.49	11.26	72.79	2.5	72.8	1.75	0.11
Length44	15.76	0.49	15.77	54.37	1.78	54.39	1.64	0.17
Length45	13.46	2.45	13.68	76.5	10.33	76.72	1.64	0.17
Length46	11.43	1.96	11.6	79.27	9.75	79.42	1.58	0.1
Length47	12.21	0.49	12.22	12.71	2.3	12.91	1.58	0.1
Length48	12.19	0.49	12.2	36.2	2.31	36.26	1.58	0.1
Length49	12.98	0.49	12.99	38.6	2.17	38.65	1.79	0.1
Length50	14.06	0.49	14.07	25.6	2	25.68	1.76	0.04
Length51	14.22	0	14.22	30.23	0	30.23	1.67	0.08
Length52	13.34	0.98	13.37	54.29	4.21	54.4	1.67	0.08
Length53	15.11	0.98	15.14	14.53	3.72	14.99	1.67	0.08
Length54	15.56	0	15.56	53.69	0	53.69	1.67	0.08
Length55	13.45	0.98	13.48	58.03	4.18	58.13	1.67	0.08
Length56	13.91	0.49	13.92	57.3	2.02	57.32	1.67	0.08
Length57	12.47	0	12.47	75.86	0	75.86	1.84	0.14
Length58	12.89	2.94	13.23	14.1	12.86	19	1.84	0.14
Length59	14.17	3.44	14.58	61.05	13.63	61.94	1.64	0.14
Length60	12.19	2.94	12.54	82.32	13.58	82.54	1.64	0.14
Length61	10.42	1.96	10.6	77.92	10.67	78.13	1.64	0.14
Length62	14.95	0.49	14.96	80.74	1.88	80.75	1.77	0.11
Length63	15.01	1.96	15.13	69.41	7.45	69.59	1.93	0.1
Length64	9.35	1.96	9.56	41.94	11.86	43.29	1.93	0.1
Length65	15.06	0.49	15.07	11.97	1.87	12.11	1.93	0.1
Length66	12.07	0.98	12.11	68.21	4.65	68.29	1.82	0.07
Length67	14.81	0.49	14.82	32.76	1.9	32.81	1.82	0.07
Length68	13.85	0.49	13.86	69.91	2.03	69.92	1.57	0.17
Length69	13.27	0.49	13.28	78.3	2.12	78.31	1.57	0.17
Length70	15.79	1.96	15.91	47	7.09	47.4	1.57	0.17
Length71	12.22	2.45	12.46	3.63	11.36	11.92	1.57	0.17
Length72	13.45	3.44	13.88	45.95	14.33	47.65	1.57	0.17
Length73	14.7	0.98	14.73	63.96	3.82	64.02	1.57	0.17
Length74	14.96	1.47	15.04	61.8	5.62	61.94	1.57	0.17
Length75	14.89	0	14.89	45.56	0	45.56	1.57	0.17
Length76	16.77	1.47	16.83	45.87	5.02	46.08	1.57	0.17
Length77	13.72	2.94	14.03	50.13	12.11	51.19	1.93	0.19
Length78	14.48	0.98	14.51	46.47	3.88	46.6	1.55	0.03
Length79	14.56	0.98	14.6	87.2	3.86	87.21	1.75	0.15
Length80	12.51	0.49	12.52	42.38	2.25	42.42	1.75	0.15
Length81	12.99	0.49	13	71.64	2.16	71.65	1.6	0.05
Length82	14.78	1.47	14.85	19.15	5.69	19.94	1.6	0.05
Length83	12.19	0	12.19	66.61	0	66.61	1.6	0.05
Length84	15	0	15	85.48	0	85.48	1.76	0.13
Length85	12.91	0.49	12.91	50.3	2.18	50.34	1.76	0.13
Length86	13.36	1.96	13.51	31.8	8.36	32.77	1.76	0.13
Length87	14.88	0.98	14.92	47.48	3.77	47.59	1.69	0.1
Length88	15.32	1.47	15.39	60.22	5.49	60.37	1.51	0.09
Length89	15.24	0.49	15.25	49.42	1.84	49.45	1.44	0.13
Length90	12.92	0	12.92	37.36	0	37.36	1.71	0.1

Length91	14.37	1.47	14.45	47.41	5.85	47.69	1.71	0.1
Length92	13.36	0.98	13.4	60.85	4.2	60.93	1.63	0.12
Length93	13.41	0	13.41	68.37	0	68.37	1.63	0.12
Length94	16.21	1.47	16.28	11.74	5.19	12.82	1.63	0.12
Length95	13.84	2.94	14.15	85.05	12.01	85.16	1.63	0.12
Length96	15.44	0	15.44	78.17	0	78.17	1.63	0.12
Length97	15.96	0.49	15.97	56.22	1.76	56.24	1.47	0.06
Length98	13.88	0.98	13.92	66.57	4.04	66.63	1.47	0.06
Length99	14.93	0	14.93	72.74	0	72.74	1.51	0.12
Length100	14.17	1.47	14.24	52.56	5.93	52.8	1.71	0.1
Length101	13.47	0	13.47	29.55	0	29.55	1.71	0.1
Length102	14.34	0	14.34	39.78	0	39.78	1.64	0.1
Length103	11.45	0	11.45	10.15	0	10.15	1.64	0.1
Length104	14.66	0.98	14.69	52.57	3.83	52.66	1.7	0.17
Length105	14.47	1.96	14.6	42.29	7.73	42.86	1.7	0.17
Length106	13.06	0.49	13.07	42.63	2.15	42.68	1.7	0.17
Length107	14.6	2.94	14.9	60.05	11.4	60.7	1.72	0.08
Length108	15.97	0	15.97	30.96	0	30.96	1.78	0.11
Length109	14.26	2.94	14.56	60.97	11.67	61.63	1.78	0.11
Length110	11.49	0.98	11.53	65.88	4.88	65.97	1.64	0.08
Length111	12.33	0.98	12.37	50.01	4.55	50.17	1.64	0.08
Length112	12.84	2.94	13.17	48.84	12.92	50.1	1.64	0.08
Length113	14.61	0.98	14.64	24.69	3.84	24.97	1.75	0.18
Length114	14.58	0.49	14.59	50.66	1.93	50.69	1.74	0.15
Length115	12.2	0	12.2	66.02	0	66.02	1.67	0.08
Length116	14.02	2.45	14.23	72.9	9.93	73.17	1.67	0.08
Length117	12.55	0	12.55	0.34	0	0.34	1.77	0.11
Length118	12.91	1.96	13.05	77.86	8.65	78	1.77	0.11
Length119	14.33	0.49	14.34	57.2	1.96	57.23	1.77	0.11
Length120	14.87	0	14.87	47.46	0	47.46	1.77	0.11
Length121	15.04	0.98	15.07	76.98	3.73	77.01	1.71	0.14

Sample ZG08, Apatite Fission-Track Age Data

No.	Ns	Area (10 ⁻⁵ cm ²)	Qs (10 ⁵ cm ⁻²)	²³⁸ U(ppm)	1σ	Dpar (μm)	Age (Ma)	1σ	Length (μm)	N
1	67	4.16	16.10	52.30	2.20	1.41 ± 0.04	61.31	7.92	0–1	0
2	120	5.59	21.50	87.50	5.50	1.51 ± 0.07	48.99	5.43	1–2	0
3	29	2.16	13.50	48.60	2.90	1.60 ± 0.16	55.35	10.80	2–3	0
4	106	6.020	17.60	59.10	2.40	1.63 ± 0.09	59.32	6.25	3–4	0
5	32	3.00	10.70	27.10	1.30	1.75 ± 0.22	78.53	14.39	4–5	0
6	60	5.28	11.40	48.60	2.60	1.57 ± 0.04	46.77	6.54	5–6	0
7	43	3.37	12.80	48.80	3.00	1.66 ± 0.16	52.28	8.60	6–7	0
8	57	3.00	19.00	64.90	3.30	1.82 ± 0.04	58.32	8.27	7–8	0
9	69	4.84	14.30	42.40	2.50	1.72 ± 0.10	67.14	9.00	8–9	0
10	65	6.24	10.40	38.80	2.10	1.59 ± 0.05	53.42	7.23	9–10	4
11	46	3.11	14.80	56.10	3.00	1.69 ± 0.03	52.58	8.25	10–11	2
12	50	2.12	23.50	83.10	8.30	1.62 ± 0.18	56.35	9.76	11–12	11
13	57	5.98	9.54	43.00	3.00	1.66 ± 0.08	44.25	6.62	12–13	21
14	39	2.50	15.60	53.40	3.70	1.77 ± 0.16	58.20	10.15	13–14	22
15	44	2.27	19.40	55.50	3.20	1.65 ± 0.07	69.58	11.23	14–15	37
16	60	2.01	29.90	116.20	5.80	2.09 ± 0.21	51.29	7.10	15–16	21
17	75	5.71	13.20	50.20	3.50	1.89 ± 0.08	52.41	7.07	16–17	3
18	26	1.99	13.10	48.40	2.50	1.78 ± 0.07	53.94	10.94	17–18	0

19	35	4.06	8.62	28.30	1.60	1.66 ± 0.16	60.67	10.81	18–19	0
20	62	5.60	11.10	41.10	2.00	1.62 ± 0.16	53.82	7.32	19–20	0
21	64	4.25	15.10	60.90	3.50	1.72 ± 0.13	49.43	6.80	MTL = 13.68	
22	98	6.07	16.10	63.30	3.50	1.68 ± 0.11	50.70	5.84	Var = 0.14	
23	69	4.69	14.70	63.80	2.60	1.94	45.95	5.84	SD = 1.56	
24	39	3.49	11.20	48.00	4.40	1.74 ± 0.21	46.53	8.58	N = 121	
25	32	1.60	20.00	55.90	3.50	1.72 ± 0.08	71.20	13.35		
26	137	9.92	13.80	59.30	3.80	1.82 ± 0.09	46.40	4.96		
27	92	5.56	16.60	63.10	3.90	1.96 ± 0.09	52.43	6.35		
28	96	6.99	13.70	64.10	3.60	1.82 ± 0.09	42.63	4.97		
29	21	3.86	5.44	16.10	1.20	1.89 ± 0.08	67.27	15.51		
30	20	1.74	11.50	37.60	2.40	1.75 ± 0.06	60.92	14.17		
31	61	5.04	12.10	30.40	1.70	1.74 ± 0.06	79.17	11.06		
32	73	2.86	25.60	105.60	8.10	1.82 ± 0.13	48.33	6.76		
33	61	4.54	13.40	35.70	2.90	1.63 ± 0.15	74.68	11.32		
2005		139.6	15.01	54.46	20.84	1.72 ± 0.14				

Pooled Age = 53.5 ± 1.7 Ma

Central Age = 54.8 ± 1.6 Ma

Sample ZG09, Apatite Fission-Track Length Data								
ID	L _{App} (μm)	Dz (μm)	L _{True} (μm)	Azimuth	Dip	Angle	DPar (μm)	SD
Length01	15.31	2.94	15.59	71.49	10.89	71.83	2.16	0.11
Length02	13.01	2.45	13.24	57.48	10.69	58.12	2.16	0.11
Length03	13.61	2.45	13.83	81.3	10.22	81.44	2.02	0.08
Length04	14.33	0	14.33	35.01	0	35.01	2.02	0.08
Length05	10.96	0.98	11	49.5	5.12	49.69	2.02	0.08
Length06	14.33	1.96	14.46	46.23	7.8	46.73	2.02	0.08
Length07	13.88	1.96	14.02	58.44	8.05	58.79	1.98	0.18
Length08	12.22	2.94	12.57	68.17	13.55	68.8	1.98	0.18
Length09	14.34	0.98	14.37	64.69	3.92	64.75	1.98	0.18
Length10	13.97	0.98	14	77.13	4.02	77.16	1.89	0.05
Length11	13.39	0	13.39	26.35	0	26.35	1.89	0.05
Length12	12.41	0	12.41	57.12	0	57.12	1.89	0.05
Length13	15.11	1.96	15.23	84.91	7.4	84.96	1.89	0.05
Length14	13.98	0.49	13.99	71.19	2.01	71.2	1.5	0.11
Length15	14.49	0	14.49	49.05	0	49.05	2.15	0.11
Length16	11.92	0	11.92	20.7	0	20.7	2.15	0.11
Length17	13.31	1.96	13.45	60.71	8.39	61.05	2.03	0.07
Length18	14.82	0.98	14.86	66.67	3.79	66.72	2.03	0.07
Length19	13.47	0	13.47	58.88	0	58.88	1.98	0.1
Length20	11.52	1.47	11.62	59.99	7.28	60.26	1.98	0.1
Length21	13.69	1.47	13.77	45.47	6.14	45.79	1.98	0.1
Length22	13	0.98	13.03	41.68	4.32	41.86	2.05	0.12
Length23	13.12	0.98	13.16	47.18	4.28	47.32	2.05	0.12
Length24	13.79	1.47	13.87	59.29	6.09	59.48	2.05	0.12
Length25	12.95	1.96	13.1	35.69	8.62	36.58	2.05	0.12
Length26	14.27	0.98	14.3	40.63	3.94	40.79	2.05	0.12
Length27	13.4	1.96	13.55	68.44	8.33	68.68	2.05	0.12
Length28	14.03	0	14.03	59.4	0	59.4	2.05	0.09
Length29	14.32	1.47	14.39	74.46	5.87	74.54	1.87	0.05
Length30	14.72	0	14.72	52.35	0	52.35	1.87	0.05
Length31	13.3	1.96	13.45	51.72	8.39	52.21	1.87	0.05

Length32	11.55	7.36	13.7	43.69	32.51	52.42	1.87	0.05
Length33	13.71	1.47	13.79	60.17	6.13	60.36	2.05	0.15
Length34	11.81	0	11.81	73.77	0	73.77	2.05	0.15
Length35	13.88	0	13.88	67.56	0	67.56	1.66	0.1
Length36	12.57	0	12.57	59.91	0	59.91	1.91	0.1
Length37	14.31	2.94	14.61	53.8	11.63	54.66	1.91	0.1
Length38	14.34	1.47	14.41	57.41	5.86	57.6	1.89	0.12
Length39	13.03	1.47	13.11	44.24	6.45	44.61	1.94	0.17
Length40	12.13	2.45	12.38	57.43	11.44	58.15	1.94	0.17
Length41	13.98	1.47	14.05	16.04	6.01	17.11	1.94	0.17
Length42	10.86	0.49	10.87	63.72	2.59	63.74	1.94	0.17
Length43	13.31	1.47	13.39	57.11	6.31	57.34	1.84	0.07
Length44	14.02	1.96	14.15	77.89	7.97	78.01	1.84	0.07
Length45	14.22	2.45	14.43	48.72	9.79	49.45	1.83	0.1
Length46	12.48	0	12.48	19.9	0	19.9	1.83	0.1
Length47	15.62	1.47	15.69	46.09	5.39	46.34	1.49	0.06
Length48	14.6	0.98	14.64	46.86	3.85	46.98	1.87	0.06
Length49	15.07	0	15.07	66.62	0	66.62	2.21	0.15
Length50	12.9	1.96	13.05	59.05	8.65	59.44	1.88	0.08
Length51	9.35	0.49	9.36	87.25	3.01	87.25	1.88	0.08
Length52	12.67	1.47	12.75	63.96	6.63	64.15	1.9	0.08
Length53	12.94	1.47	13.03	55.66	6.49	55.91	1.9	0.08
Length54	12.97	0	12.97	30.68	0	30.68	1.9	0.08
Length55	13.75	0	13.75	67.31	0	67.31	1.98	0.11
Length56	15.02	0.49	15.03	43.49	1.87	43.53	1.91	0.11
Length57	13.7	2.45	13.92	54.06	10.16	54.71	1.91	0.11
Length58	15.12	1.47	15.19	83.91	5.56	83.94	1.91	0.11
Length59	13.65	0	13.65	32.55	0	32.55	2	0.19
Length60	14.68	0	14.68	23.26	0	23.26	2	0.19
Length61	14.75	1.96	14.88	58.72	7.58	59.02	2	0.19
Length62	14.16	1.47	14.24	63.5	5.94	63.66	2.01	0.23
Length63	10.69	0.49	10.7	82.05	2.63	82.06	1.91	0.04
Length64	14.99	1.96	15.12	73.04	7.46	73.18	1.91	0.04
Length65	14.29	2.94	14.59	85.26	11.64	85.36	1.91	0.04
Length66	13.41	0.98	13.45	38.75	4.19	38.94	1.91	0.04
Length67	14.26	2.45	14.47	72.9	9.76	73.15	1.91	0.04
Length68	13.24	1.96	13.38	82.73	8.43	82.81	1.88	0.11
Length69	13.62	3.44	14.05	76.78	14.16	77.19	1.99	
Length70	13.66	0.49	13.66	66.17	2.06	66.19	1.99	
Length71	12.8	0	12.8	23.4	0	23.4	1.99	
Length72	12.94	2.45	13.17	38.55	10.74	39.79	1.99	
Length73	15.31	1.47	15.38	81.3	5.49	81.34	1.99	
Length74	14.47	0	14.47	48.63	0	48.63	2	0.13
Length75	15.32	1.96	15.45	70	7.3	70.17	1.81	0.14
Length76	13.09	2.45	13.32	70.33	10.62	70.68	1.81	0.14
Length77	13.99	3.44	14.4	54.23	13.8	55.42	1.81	0.14
Length78	14.16	1.47	14.24	68.58	5.94	68.7	1.81	0.14
Length79	13.39	3.93	13.96	76.93	16.34	77.46	1.81	0.14
Length80	13.14	0.49	13.15	80.78	2.14	80.78	1.93	0.08
Length81	8.84	3.44	9.48	61.2	21.25	63.32	1.93	0.08
Length82	13.79	1.47	13.87	86.17	6.1	86.19	1.93	0.08
Length83	13.25	4.42	13.97	89.53	18.43	89.55	2.04	0.06
Length84	13.07	3.44	13.51	76.76	14.73	77.2	2.04	0.06

Length85	11.05	0.49	11.06	80.4	2.54	80.41	2.04	0.06
Length86	9.78	0.98	9.83	59.49	5.73	59.66	2.04	0.06
Length87	14.6	0.98	14.63	56.38	3.85	56.47	2.04	0.06
Length88	12.95	0.49	12.96	70.37	2.17	70.39	2.04	0.06
Length89	13.77	0	13.77	57.29	0	57.29	1.94	0.13
Length90	12.39	3.44	12.86	46.07	15.5	48.04	1.94	0.13
Length91	13.25	0.98	13.29	74.37	4.24	74.41	1.94	0.13
Length92	14.63	0	14.63	41.34	0	41.34	1.9	0.11
Length93	11.3	3.93	11.96	59.92	19.16	61.74	1.9	0.11
Length94	13.36	0	13.36	79.28	0	79.28	1.88	0.06
Length95	13.71	0.49	13.72	53.84	2.05	53.87	1.88	0.06
Length96	13.56	0.98	13.59	37.93	4.14	38.12	1.84	0.22
Length97	12.82	1.96	12.97	60.16	8.71	60.54	1.99	0.12
Length98	13.16	2.45	13.38	85.74	10.57	85.81	1.99	0.12
Length99	14.15	1.47	14.22	50.09	5.94	50.34	1.99	0.12
Length100	13.95	0	13.95	59.78	0	59.78	1.99	0.12
Length101	14.08	0.49	14.09	68.6	2	68.61	1.99	0.12
Length102	15.72	1.96	15.85	21.16	7.12	22.28	1.99	0.12

Sample ZG09, Apatite Fission-Track Age Data

No.	Ns	Area (10 ⁻⁵ cm ²)	Q ^s (10 ⁵ cm ⁻²)	²³⁸ U(ppm)	1σ	Dpar (μm)	Age (Ma)	1σ	Length (μm)	N
1	6	2.46	2.44	5.41	0.46	1.91 ± 0.04	89.63	37.38	0–1	0
2	17	4.28	4.00	13.43	0.71	1.83 ± 0.13	59.36	14.73	1–2	0
3	23	2.41	9.55	30.90	1.60	1.85 ± 0.00	61.57	13.23	2–3	0
4	57	4.07	14.01	55.50	3.10	2.02 ± 0.12	50.32	7.23	3–4	0
5	85	4.04	21.05	89.00	5.90	2.00 ± 0.05	47.16	5.99	4–5	0
6	48	4.83	9.95	36.10	2.00	1.94 ± 0.08	54.90	8.49	5–6	0
7	46	6.65	6.92	16.20	1.00	1.89 ± 0.05	84.89	13.57	6–7	0
8	26	4.51	5.77	28.10	1.30	2.00 ± 0.11	40.93	8.25	7–8	0
9	2	2.19	0.91	2.15	0.28	1.90 ± 0.07	84.44	60.71	8–9	0
10	47	3.53	13.31	56.30	3.00	2.03 ± 0.07	47.14	7.32	9–10	3
11	4	3.16	1.26	4.58	0.59	1.72 ± 0.10	54.99	28.40	10–11	2
12	8	5.34	1.50	5.30	0.66	2.18 ± 0.11	56.32	21.11	11–12	6
13	15	5.14	2.92	6.81	0.44	2.00 ± 0.12	85.24	22.69	12–13	11
14	3	2.80	1.07	4.45	0.47	1.67 ± 0.12	48.07	28.22	13–14	40
15	3	3.81	0.79	2.31	0.26	1.89 ± 0.05	67.81	39.89	14–15	30
16	65	5.60	11.62	30.00	1.80	1.98 ± 0.05	77.05	10.62	15–16	10
17	31	4.13	7.50	27.60	1.40	1.95 ± 0.07	54.15	10.11	16–17	0
18	20	3.47	5.76	23.40	1.50	2.10 ± 0.09	49.06	11.41	17–18	0
19	24	6.35	3.78	17.60	1.10	1.82 ± 0.12	42.86	9.15	18–19	0
20	4	3.72	1.07	3.56	0.29	1.87 ± 0.14	60.09	30.44	19–20	0
21	11	4.08	2.69	7.88	0.46	2.02 ± 0.11	68.06	20.90	MTL = 13.59	
22	31	2.73	11.34	41.40	2.00	2.00 ± 0.10	54.58	10.15	Var = 0.12	
23	38	4.41	8.62	35.80	2.10	2.17 ± 0.11	47.99	8.28	SD = 1.24	
24	8	3.14	2.55	10.37	0.76	2.03 ± 0.11	49.04	17.71	N = 102	
25	7	4.23	1.65	5.29	0.58	1.89 ± 0.04	62.23	24.49		
26	27	2.37	11.39	45.50	3.10	1.92 ± 0.06	49.90	10.19		
27	42	3.40	12.37	37.40	3.50	1.90 ± 0.07	65.85	11.88		
28	20	2.78	7.19	21.20	1.40	1.95 ± 0.16	67.50	15.74		
29	12	3.370	3.56	11.44	0.92	1.70 ± 0.09	62.01	18.58		
30	16	5.830	2.75	11.26	0.77	2.02 ± 0.17	48.62	12.60		
31	36	10.92	3.30	10.24	0.70	1.72 ± 0.15	64.13	11.55		

32	22	7.26	3.03	12.86	0.98	1.91 ± 0.12	46.98	10.64
33	43	5.62	7.66	18.20	1.20	2.06 ± 0.17	83.65	13.90
34	12	4.54	2.64	8.71	0.59	1.93 ± 0.09	60.44	17.92
35	36	5.47	6.58	19.20	1.20	1.74 ± 0.08	68.21	12.14
36	13	4.00	3.25	11.22	0.75	1.96 ± 0.18	57.64	16.44
908		156.6	5.99	21.30	18.94	1.93 ± 0.12		

Pooled Age = 56.8 ± 2.2 Ma

Central Age = 58.1 ± 2.4 Ma

Sample ZG11, Apatite Fission-Track Length Data.

ID	L _{App} (μm)	Dz (μm)	L _{True} (μm)	Azimuth	Dip	Angle	DPar (μm)	SD
Length01	15.61	1.47	15.68	56.64	5.39	56.81	1.68	0.12
Length02	13.44	0.49	13.45	67.13	2.09	67.15	1.66	0.05
Length03	10.59	1.47	10.69	70.52	7.91	70.72	1.66	0.05
Length04	13.3	0	13.3	53.54	0	53.54	1.66	0.05
Length05	13.4	0	13.4	56.14	0	56.14	1.76	0.17
Length06	14.66	0	14.66	46.73	0	46.73	1.76	0.17
Length07	12.94	0.98	12.97	72.96	4.34	73.01	1.35	0.12
Length08	11.44	0.49	11.45	52.62	2.46	52.66	1.67	0.09
Length09	9.26	0.49	9.27	80.53	3.03	80.54	1.54	0.04
Length10	11.07	1.96	11.24	79.26	10.06	79.42	1.67	0.12
Length11	11.6	1.47	11.69	42.64	7.23	43.13	1.67	0.12
Length12	12.2	2.45	12.44	55.56	11.38	56.33	1.67	0.08
Length13	13.28	2.45	13.51	28.32	10.47	30.04	1.67	0.08
Length14	11.2	1.47	11.3	87.75	7.49	87.77	1.67	0.08
Length15	11.46	1.47	11.55	76.98	7.32	77.09	1.66	0.1
Length16	13.61	1.47	13.69	72.73	6.17	72.83	1.66	0.1
Length17	10.4	0.49	10.41	76.44	2.7	76.45	1.66	0.1
Length18	10.96	0.98	11	77.94	5.12	77.99	1.66	0.1
Length19	12.79	0.98	12.82	59.78	4.39	59.88	1.66	0.1
Length20	12.94	0.98	12.97	79.05	4.34	79.08	1.66	0.1
Length21	11.79	0.49	11.8	54.52	2.38	54.56	1.66	0.1
Length22	13.53	2.45	13.75	28.14	10.28	29.81	1.66	0.1
Length23	15.54	1.47	15.61	46	5.41	46.25	1.66	0.1
Length24	12.61	2.45	12.85	74.92	11.01	75.2	1.66	0.1
Length25	12.02	1.47	12.11	53.13	6.98	53.44	1.66	0.1
Length26	11.77	2.45	12.02	63.56	11.78	64.16	1.66	0.1
Length27	14.1	0.49	14.11	32.22	1.99	32.28	1.66	0.1
Length28	10.11	0.98	10.16	67.83	5.54	67.94	1.73	0.09
Length29	12.13	0	12.13	63.26	0	63.26	1.73	0.09
Length30	13.21	0.98	13.25	25.32	4.25	25.65	1.73	0.09
Length31	12.04	1.96	12.2	49.17	9.26	49.82	1.73	0.09
Length32	11.28	0	11.28	75.68	0	75.68	1.53	0.11
Length33	11.68	2.45	11.94	64.59	11.86	65.17	1.53	0.11
Length34	12.04	0.49	12.05	73	2.33	73.01	1.61	0.09
Length35	13.71	0.98	13.74	71.78	4.1	71.83	1.69	0.08
Length36	14.43	2.45	14.64	58.19	9.65	58.69	1.69	0.08
Length37	12.34	0.49	12.35	59.85	2.28	59.88	1.51	0.09
Length38	12.52	0.49	12.53	57.75	2.24	57.78	1.74	0.06
Length39	14.06	0.98	14.1	40.44	3.99	40.6	1.74	0.06
Length40	10.91	0	10.91	40.88	0	40.88	1.74	0.06
Length41	8.45	0.98	8.51	22.9	6.63	23.79	1.74	0.06

Length42	13.76	0.49	13.77	72.35	2.04	72.36	1.74	0.06
Length43	13.51	2.45	13.73	76.4	10.29	76.63	1.74	0.06
Length44	13.46	0.98	13.5	70.54	4.17	70.6	1.74	0.06
Length45	11.7	0.49	11.71	20.85	2.4	20.98	1.74	0.06
Length46	13.78	0	13.78	84.47	0	84.47	1.74	0.06
Length47	14.6	0	14.6	62.9	0	62.9	1.74	0.06
Length48	13.83	1.96	13.97	80.24	8.08	80.34	1.7	0.07
Length49	10.22	0.49	10.23	33.8	2.75	33.89	1.7	0.07
Length50	14.59	0.49	14.6	74.51	1.93	74.52	1.69	0.12
Length51	13.1	0.98	13.14	82.34	4.29	82.36	1.69	0.12
Length52	15.49	0	15.49	45.47	0	45.47	1.76	0.18
Length53	11.19	1.96	11.36	39.58	9.95	40.62	1.76	0.18
Length54	14.75	0.49	14.76	55.56	1.91	55.58	1.76	0.18
Length55	9.61	0	9.61	36.18	0	36.18	1.76	0.18
Length56	13.71	1.47	13.79	65.54	6.13	65.69	1.47	0.08
Length57	10.37	1.47	10.48	62.47	8.08	62.76	1.47	0.08
Length58	13.44	0.98	13.48	33.86	4.18	34.08	1.66	0.06
Length59	12.21	0	12.21	78.93	0	78.93	1.66	0.06
Length60	16.54	0.98	16.57	78.59	3.4	78.61	1.66	0.06
Length61	14.61	1.47	14.68	36.08	5.75	36.47	1.8	0.12
Length62	12.54	1.47	12.63	73.44	6.69	73.56	1.8	0.12
Length63	11.22	0	11.22	69.54	0	69.54	1.8	0.12
Length64	12.26	0	12.26	47.09	0	47.09	1.73	0.24
Length65	14.5	2.45	14.71	60.04	9.6	60.5	1.77	0.12
Length66	13.46	0	13.46	59.48	0	59.48	1.77	0.12
Length67	15.15	0.49	15.15	44.9	1.86	44.93	1.61	0.23
Length68	15.03	0.98	15.07	26.48	3.74	26.73	1.61	0.23
Length69	12.01	0.98	12.05	64.89	4.67	64.98	1.59	0.1
Length70	12.41	0	12.41	51.78	0	51.78	1.61	0.08
Length71	13.87	0.49	13.88	34.7	2.03	34.75	1.61	0.08
Length72	14.32	0.49	14.33	78.83	1.96	78.83	1.61	0.08
Length73	12.3	0	12.3	50.25	0	50.25	1.67	0.04
Length74	11.09	4.42	11.94	73.44	21.72	74.65	1.67	0.04
Length75	11.61	0.49	11.62	61.21	2.42	61.23	1.8	0.07
Length76	14.05	1.47	14.12	57.37	5.98	57.57	1.56	0.08
Length77	12.02	0.98	12.06	74.74	4.67	74.8	1.56	0.08
Length78	13.34	1.47	13.42	40.75	6.3	41.15	1.6	0.06
Length79	13.04	0	13.04	82.91	0	82.91	1.71	0.11
Length80	10.54	0.49	10.55	69.48	2.67	69.5	1.71	0.11
Length81	11.76	0.98	11.8	50.26	4.77	50.43	1.67	0.12
Length82	11.74	0.98	11.79	55.97	4.78	56.1	1.67	0.12
Length83	12.61	1.96	12.76	40.8	8.85	41.58	1.67	0.12
Length84	15.29	2.45	15.48	30.44	9.12	31.65	1.67	0.12
Length85	14.52	0.49	14.53	48.03	1.94	48.06	1.57	0.06
Length86	12.4	1.96	12.56	72.87	9	73.09	1.57	0.06
Length87	10.2	1.96	10.39	28.48	10.89	30.33	1.66	0.21
Length88	13.53	2.94	13.85	75.96	12.28	76.28	1.66	0.21
Length89	13.95	0.49	13.96	76.8	2.01	76.81	1.78	0.13
Length90	13.08	0	13.08	56.49	0	56.49	1.78	0.13
Length91	14.05	1.96	14.18	73.68	7.96	73.85	1.78	0.13
Length92	12.85	1.47	12.93	41.4	6.54	41.82	1.78	0.13
Length93	14.34	0.49	14.34	42.77	1.96	42.81	1.78	0.13
Length94	14.09	0.49	14.1	76.05	1.99	76.06	1.57	0.06

Length95	15.07	0.98	15.11	37.22	3.73	37.38	1.59	0.1
Length96	12.22	1.96	12.38	44.26	9.13	44.99	1.59	0.1
Length97	11.28	2.45	11.54	73.42	12.28	73.81	1.84	0.09
Length98	15.58	1.47	15.65	30.8	5.4	31.23	1.84	0.09
Length99	11.23	0	11.23	67	0	67	1.6	0.04
Length100	11.43	1.96	11.6	68.51	9.74	68.83	1.6	0.04
Length101	10.95	0.98	10.99	67.39	5.12	67.49	1.6	0.04
Length102	12.48	0	12.48	14.89	0	14.89	1.52	0.05
Length103	10.23	0	10.23	56.84	0	56.84	1.52	0.05
Length104	13.77	1.47	13.85	47.54	6.1	47.84	1.52	0.05
Length105	12.41	0	12.41	60.88	0	60.88	1.52	0.05
Length106	13.18	0	13.18	56.05	0	56.05	1.65	0.12
Length107	11.35	0.49	11.36	65.61	2.48	65.63	1.65	0.12
Length108	14.99	1.47	15.06	30.08	5.61	30.55	1.65	0.12
Length109	14.97	0	14.97	47.1	0	47.1	1.67	0.06
Length110	13.27	1.96	13.42	67.4	8.41	67.66	1.64	0.11

Sample ZG11, Apatite Fission-Track Age Data

No.	Ns	Area (10 ⁻⁵ cm ²)	Qs (10 ⁵ cm ⁻²)	²³⁸ U(ppm)	1σ	Dpar (μm)	Age (Ma)	1σ	Length (μm)	N
1	60	3.62	16.57	51.30	3.40	1.74 ± 0.11	64.32	9.33	0–1	0
2	20	2.12	9.45	30.40	1.90	1.80 ± 0.10	61.88	14.37	1–2	0
3	26	2.17	11.98	41.10	2.90	1.79 ± 0.09	58.07	12.10	2–3	0
4	18	2.61	6.90	20.50	1.10	1.79 ± 0.19	66.98	16.19	3–4	0
5	31	3.34	9.28	27.20	1.90	1.73 ± 0.06	67.92	13.09	4–5	0
6	17	3.13	5.43	16.20	1.10	1.72 ± 0.14	66.67	16.79	5–6	0
7	58	2.46	23.54	71.00	3.80	1.88 ± 0.11	66.01	9.36	6–7	0
8	67	5.73	11.69	32.70	2.00	1.94 ± 0.11	71.15	9.72	7–8	0
9	29	1.80	16.08	71.30	4.30	1.79 ± 0.08	44.98	8.78	8–9	1
10	38	1.97	19.25	52.70	3.80	1.74 ± 0.05	72.69	12.90	9–10	2
11	60	3.11	19.28	81.30	6.30	1.77 ± 0.08	47.28	7.12	10–11	10
12	50	2.33	21.49	63.90	3.50	1.66 ± 0.09	66.95	10.15	11–12	20
13	35	2.63	13.33	43.30	2.50	1.69 ± 0.23	61.31	10.95	12–13	25
14	19	1.98	9.579	26.30	2.00	1.70 ± 0.06	72.48	17.52	13–14	26
15	120	6.37	18.83	70.80	4.60	1.87 ± 0.07	53.01	5.94	14–15	16
16	28	2.40	11.65	33.20	1.60	1.74 ± 0.15	69.84	13.62	15–16	9
17	36	3.53	10.21	34.00	1.80	1.79 ± 0.05	59.82	10.46	16–17	1
18	60	3.75	16.00	50.40	2.90	1.78 ± 0.12	63.22	8.94	17–18	0
19	15	1.24	12.10	51.00	2.90	1.83 ± 0.12	47.31	12.51	18–19	0
20	85	2.88	29.56	79.30	4.40	1.75 ± 0.07	74.17	9.04	19–20	0
21	18	1.33	13.54	39.90	2.50	1.74 ± 0.10	67.56	16.48	MTL = 12.84	
22	73	3.39	21.51	62.40	4.30	1.90 ± 0.08	68.62	9.32	Var = 0.15	
23	35	3.70	9.46	32.20	1.80	1.95 ± 0.04	58.51	10.42	SD = 1.57	
24	19	2.09	9.09	28.90	2.90	1.70 ± 0.12	62.63	15.68	N = 110	
25	47	5.70	8.24	31.90	1.60	1.75 ± 0.06	51.51	7.94		
26	104	5.13	20.27	85.00	5.20	1.80 ± 0.10	47.55	5.50		
27	24	3.08	7.80	22.10	1.30	1.96 ± 0.07	70.26	14.93		
28	41	2.14	19.18	87.50	6.90	1.74 ± 0.08	43.72	7.65		
29	57	2.57	22.19	56.50	3.50	1.81 ± 0.08	78.12	11.42		
30	14	2.10	6.67	20.30	1.60	1.63 ± 0.15	65.39	18.22		
31	35	3.95	8.85	25.30	1.80	1.73 ± 0.07	69.65	12.77		
1339		94.36	14.16	46.45	21.38	1.78 ± 0.08				

Pooled Age = 60.2 ± 1.8 Ma

Central Age = 61.5 ± 2.0 Ma

Note: N_s is the number of spontaneous tracks counted; Q_s is the spontaneous track density; D_{par} is the long axis of track etch pit parallel to the crystallographic c -axis; MTL = mean track length; SD = D_{par} standard deviation; N = number of track lengths measured; ID = length name; L_{App} = apparent length; dz = corrected z depth; L_{True} = true length; angle = angle to c -axis.

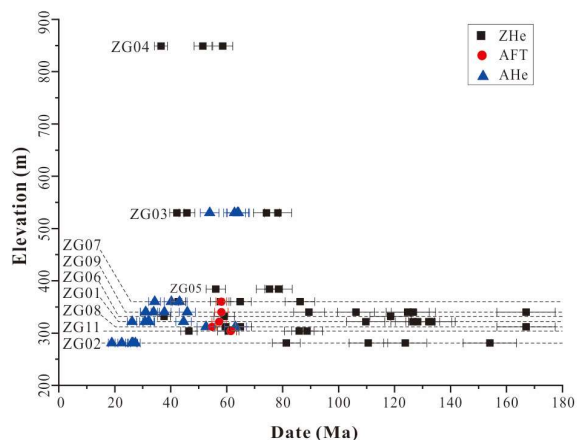


Figure 1. Plot of ZHe, AHe and AFT ages versus sample elevation.