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Tectonothermal evolution of the Southwestern central zone, Damara Belt, Namibia

Longridge, Luke

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Appendix 2A: U-Pb Zircon, Monazite and Titanite Data

Summary of SHRIMP U-Pb zircon data for sample LID036

Grain.Spot	% $^{206}Pb_c$	ppm U	ppm Th	$^{232}Th/^{238}U$	ppm $^{206}Pb^*$	(1) $^{206}Pb/^{238}U$ Age		(1) $^{207}Pb/^{206}Pb$ Age		% Dis-cor-dant	Total $^{238}U/^{206}Pb$	±%	Total $^{207}Pb/^{206}Pb$	±%	(1) $^{238}U/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{235}U$	±%	(1) $^{206}Pb^*/^{238}U$	±%	err corr
1.1	0.10	410	214	0.54	126	1967	±21	2022	±14	3	2.8	1.3	0.12537	0.75	2.803	1.3	0.12449	0.78	6.125	1.5	0.3568	1.3	.850
1.2	0.22	407	235	0.60	91.5	1495	±17	1908	±11	22	3.823	1.3	0.11875	0.51	3.831	1.3	0.11682	0.62	4.204	1.4	0.261	1.3	.897
2.1	0.07	535	247	0.48	165	1978	±21	2028.8	± 7.3	3	2.782	1.2	0.12559	0.37	2.784	1.2	0.125	0.41	6.191	1.3	0.3592	1.2	.949
2.2	5.83	346	191	0.57	104	1842	±21	1979	±42	7	2.847	1.3	0.1727	1	3.023	1.3	0.1215	2.4	5.54	2.7	0.3308	1.3	.495
3.1	0.27	191	96	0.52	57.7	1937	±23	2047	±21	5	2.845	1.3	0.1287	0.99	2.853	1.3	0.1263	1.2	6.1	1.8	0.3505	1.3	.756
4.1	0.13	749	194	0.27	186	1638	±17	1957.1	± 7.7	16	3.453	1.2	0.12116	0.36	3.458	1.2	0.12006	0.43	4.788	1.3	0.2892	1.2	.942
4.2	0.15	413	177	0.44	123	1921	±21	2028.1	± 9.4	5	2.876	1.2	0.12623	0.43	2.88	1.2	0.12495	0.53	5.982	1.4	0.3472	1.2	.920
5.1	0.14	469	294	0.65	122	1697	±18	1977.6	± 9.4	14	3.317	1.2	0.12266	0.47	3.322	1.2	0.12144	0.53	5.041	1.3	0.3011	1.2	.919
6.1	0.11	1165	86	0.08	181	1071	±12	1578.4	± 8.6	32	5.528	1.2	0.09855	0.4	5.534	1.2	0.09758	0.46	2.431	1.3	0.1807	1.2	.933
6.2	0.13	465	181	0.40	124	1745	±19	1987.6	± 8.7	12	3.212	1.2	0.12326	0.43	3.216	1.2	0.12213	0.49	5.236	1.3	0.3109	1.2	.929
7.1	0.11	211	105	0.51	65.3	1980	±23	2031	±12	3	2.778	1.3	0.12608	0.61	2.781	1.3	0.12515	0.7	6.206	1.5	0.3596	1.3	.885
7.2	0.44	208	78	0.39	54.9	1724	±20	1982	±30	13	3.248	1.3	0.1256	1.5	3.262	1.3	0.1218	1.7	5.15	2.1	0.3066	1.3	.626
8.1	0.04	335	477	1.47	108	2057	±22	2058.2	± 9.6	0	2.66	1.3	0.12742	0.48	2.661	1.3	0.1271	0.55	6.586	1.4	0.3758	1.3	.919
8.2	0.32	712	129	0.19	159	1489	±17	1875	±13	21	3.836	1.2	0.11748	0.53	3.848	1.2	0.11471	0.75	4.11	1.5	0.2599	1.2	.857
9.1	0.12	309	141	0.47	99.5	2052	±23	2047	±12	0	2.665	1.3	0.12737	0.61	2.668	1.3	0.12629	0.66	6.526	1.5	0.3748	1.3	.891
10.1	0.19	1155	209	0.19	285	1624	±17	1921.1	± 7.9	15	3.483	1.2	0.11934	0.39	3.49	1.2	0.11767	0.44	4.649	1.3	0.2865	1.2	.938
11.1	0.11	504	283	0.58	157	1993	±21	2027.3	± 9.5	2	2.758	1.2	0.12584	0.47	2.761	1.2	0.12489	0.53	6.237	1.3	0.3622	1.2	.918
12.1	0.32	255	142	0.57	71.8	1820	±21	1993	±15	9	3.055	1.3	0.12535	0.61	3.065	1.3	0.1225	0.84	5.511	1.6	0.3262	1.3	.844
12.2	0.66	844	132	0.16	134	1089	±12	1670	±15	35	5.399	1.2	0.10819	0.45	5.435	1.2	0.10251	0.79	2.6	1.5	0.184	1.2	.841
13.1	0.06	556	415	0.77	167	1934	±21	2043.5	± 7.8	5	2.857	1.2	0.12658	0.4	2.858	1.2	0.12604	0.44	6.08	1.3	0.3498	1.2	.942
14.1	0.03	304	158	0.54	96.2	2023	±22	2046.2	± 9.5	1	2.712	1.3	0.12652	0.52	2.713	1.3	0.12623	0.54	6.416	1.4	0.3686	1.3	.923
14.2	0.15	977	27	0.03	241	1626	±21	1945.1	± 7.3	16	3.481	1.4	0.12061	0.34	3.487	1.4	0.11926	0.41	4.716	1.5	0.2868	1.4	.962
15.1	0.28	159	86	0.56	48.7	1957	±24	2033	±19	4	2.811	1.4	0.12775	0.75	2.819	1.4	0.1253	1	6.13	1.8	0.3547	1.4	.805
18.1	0.02	1600	320	0.21	352	1471	±16	1794.4	± 8	18	3.902	1.2	0.10988	0.43	3.902	1.2	0.1097	0.44	3.876	1.3	0.2562	1.2	.938
18.2	0.02	502	196	0.40	152	1947	±21	2041	±13	5	2.836	1.2	0.12606	0.7	2.836	1.2	0.12585	0.71	6.118	1.4	0.3526	1.2	.868

Errors are 1-sigma; Pb_c and Pb^* indicate the common and radiogenic portions, respectively.

Error in Standard calibration was 0.57% (not included in above errors but required when comparing data from different mounts).

(1) Common Pb corrected using measured ^{204}Pb.

Summary of SHRIMP U-Pb zircon data for sample LID041

Grain.Spot	% $^{206}Pb_c$	ppm U	ppm Th	$^{232}Th/^{238}U$	ppm $^{206}Pb^*$	(1) $^{206}Pb/^{238}U$ Age		(1) $^{207}Pb/^{206}Pb$ Age		% Dis-cor-dant	Total $^{238}U/^{206}Pb$	±%	Total $^{207}Pb/^{206}Pb$	±%	(1) $^{238}U/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{235}U$	±%	(1) $^{206}Pb^*/^{238}U$	±%	err corr
1.1	0.08	228	113	0.51	68.7	1936	±31	2016	±13	4	2.852	1.9	0.12486	0.63	2.855	1.9	0.12413	0.71	6	2	0.3503	1.9	.935
2.1	0.14	361	172	0.49	95.3	1726	±19	2014	±13	14	3.252	1.3	0.12513	0.56	3.256	1.3	0.12396	0.76	5.249	1.5	0.3071	1.3	.861
2.2	0.11	1214	346	0.29	334	1791	±19	1991	± 9.2	10	3.119	1.2	0.12332	0.5	3.122	1.2	0.12237	0.52	5.403	1.3	0.3203	1.2	.918
3.1	0.13	365	126	0.36	111	1952	±22	2030	±14	4	2.825	1.3	0.12622	0.73	2.828	1.3	0.12511	0.78	6.099	1.5	0.3536	1.3	.860
4.1	0.06	686	269	0.40	166	1597	±17	1942.4	± 8.7	18	3.556	1.2	0.11955	0.42	3.558	1.2	0.11908	0.49	4.615	1.3	0.2811	1.2	.929
5.1	0.16	469	273	0.60	125	1737	±19	1974.6	± 9.6	12	3.229	1.3	0.12257	0.48	3.234	1.3	0.12124	0.54	5.168	1.4	0.3092	1.3	.918
6.1	1.83	595	108	0.19	50.5	596.6	± 7.3	1625	±35	63	10.12	1.3	0.11425	0.73	10.31	1.3	0.1	1.9	1.337	2.3	0.097	1.3	.563
7.1	0.02	1200	118	0.10	312	1704	±21	1957.7	± 8.3	13	3.304	1.4	0.12031	0.45	3.305	1.4	0.1201	0.46	5.01	1.5	0.3026	1.4	.950

Errors are 1-sigma; Pb_c and Pb^* indicate the common and radiogenic portions, respectively.

Error in Standard calibration was 0.57% (not included in above errors but required when comparing data from different mounts).

(1) Common Pb corrected using measured ^{204}Pb.

Summary of SHRIMP U-Pb zircon data for sample LID045

Grain.Spot	% $^{206}Pb_c$	ppm U	ppm Th	$^{232}Th/^{238}U$	ppm $^{206}Pb^*$	(1) $^{206}Pb/^{238}U$ Age		(1) $^{207}Pb/^{206}Pb$ Age		% Dis-cor-dant	Total $^{238}U/^{206}Pb$	±%	Total $^{207}Pb/^{206}Pb$	±%	(1) $^{238}U/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{235}U$	±%	(1) $^{206}Pb^*/^{238}U$	±%	err corr
1.1	0.03	323	161	0.52	95.8	1909	±19	2027	±13	6	2.9	1.2	0.12517	0.75	2.901	1.2	0.12489	0.75	5.936	1.4	0.3447	1.2	.841
1.2	0.01	253	138	0.56	74	1889	±21	2019.3	± 7.1	6	2.937	1.3	0.12445	0.4	2.937	1.3	0.12433	0.4	5.836	1.3	0.3405	1.3	.954
2.1	0.06	266	203	0.79	82.5	1982	±21	2023	± 7.1	2	2.776	1.3	0.12512	0.37	2.777	1.3	0.12459	0.4	6.185	1.3	0.3601	1.3	.953
3.1	0.03	232	138	0.61	70.4	1948	±22	2041	±11	5	2.833	1.3	0.12608	0.59	2.834	1.3	0.12583	0.6	6.122	1.4	0.3529	1.3	.905
3.2	0.00	440	190	0.45	122	1800	±17	2010.8	± 5.7	10	3.104	1.1	0.12374	0.32	3.104	1.1	0.12374	0.32	5.496	1.1	0.3222	1.1	.958
4.1	0.01	464	82	0.18	134	1863	±18	2011	±12	7	2.984	1.1	0.12378	0.67	2.984	1.1	0.12372	0.67	5.717	1.3	0.3351	1.1	.860
5.1	0.03	301	104	0.36	92.4	1967	±24	2040.2	± 9	4	2.803	1.4	0.12609	0.49	2.803	1.4	0.12581	0.51	6.187	1.5	0.3567	1.4	.942
6.1	0.00	336	109	0.34	94.1	1820	±22	2002.2	± 8.7	9	3.066	1.4	0.12314	0.49	3.066	1.4	0.12314	0.49	5.538	1.5	0.3262	1.4	.945
7.1	0.02	835	243	0.30	218	1709	±20	2029	±12	16	3.294	1.4	0.12522	0.66	3.294	1.4	0.12501	0.66	5.232	1.5	0.3035	1.4	.898
7.2	0.00	937	85	0.09	292	1995	±23	2028.8	± 7.6	2	2.758	1.3	0.125	0.43	2.758	1.3	0.125	0.43	6.25	1.4	0.3626	1.3	.953
11.1	0.00	186	82	0.46	51.4	1802	±23	2003	±17	10	3.101	1.5	0.1232	0.97	3.101	1.5	0.1232	0.97	5.476	1.8	0.3224	1.5	.837
12.1	0.00	189	88	0.48	55.9	1912	±24	2015	±11	5	2.896	1.5	0.12404	0.62	2.896	1.5	0.12404	0.62	5.905	1.6	0.3452	1.5	.922
12.2	0.00	398	223	0.58	123	1976	±24	2043.7	± 7.6	3	2.788	1.4	0.12606	0.43	2.788	1.4	0.12606	0.43	6.234	1.5	0.3586	1.4	.955
13.1	0.00	145	58	0.41	43.7	1941	±33	2019	±13	4	2.847	2	0.12428	0.71	2.847	2	0.12428	0.71	6.02	2.1	0.3512	2	.941
14.1	0.00	568	180	0.33	168	1913	±23	2025.8	± 7.1	6	2.895	1.4	0.12479	0.4	2.895	1.4	0.12479	0.4	5.943	1.4	0.3454	1.4	.959
15.1	0.00	693	56	0.08	186	1754	±21	1970	±18	11	3.197	1.4	0.1209	10	3.197	1.4	0.1209	10	5.214	1.7	0.3128	1.4	.808
16.1	0.00	177	104	0.61	56.4	2032	±26	2063	±23	2	2.699	1.5	0.1275	1.3	2.699	1.5	0.1275	1.3	6.51	2	0.3705	1.5	.753
17.1	0.00	290	155	0.55	90.9	2007	±25	2045	±23	2	2.737	1.4	0.1262	1.3	2.737	1.4	0.1262	1.3	6.36	1.9	0.3653	1.4	.750
18.1	0.06	348	187	0.55	89	1679	±21	2022	±12	17	3.36	1.4	0.12505	0.67	3.362	1.4	0.12449	0.69	5.105	1.6	0.2974	1.4	.897
18.2	0.11	136	56	0.43	42.6	1997	±26	2049	±22	3	2.751	1.5	0.1274	1.2	2.754	1.5	0.1264	1.3	6.33	2	0.3631	1.5	.770

Errors are 1-sigma; Pb_c and Pb^* indicate the common and radiogenic portions, respectively.

Error in Standard calibration was 0.77% (not included in above errors but required when comparing data from different mounts).

(1) Common Pb corrected using measured ^{204}Pb.

Summary of SHRIMP U-Pb zircon data for sample LKR021

Grain.Spot	% $^{206}Pb_c$	ppm U	ppm Th	$^{232}Th/^{238}U$	ppm $^{206}Pb^*$	(3) $^{206}Pb/^{238}U$ Age		(3) $^{207}Pb/^{206}Pb$ Age		% Dis-cor-dant	Total $^{238}U/^{206}Pb$	±%	Total $^{207}Pb/^{206}Pb$	±%	(3) $^{238}U/^{206}Pb^*$	±%	(3) $^{207}Pb^*/^{206}Pb^*$	±%	(3) $^{207}Pb^*/^{235}U$	±%	(3) $^{206}Pb^*/^{238}U$	±%	err corr
1.1	0.22	87	3	0.03	6.9	568.7	8.6	475	65	-20	10.82	1.6	.0584	2.5	10.84	1.6	.0566	3.0	0.72	3.5	.0922	1.6	.527
1.2	-0.02	693	28	0.04	54.3	563.3	5.9	555	23	-2	10.95	1.1	.0585	1.0	10.95	1.1	.0587	1.0	0.74	1.6	.0913	1.1	.756
2.1	0.16	1348	171	0.13	99.2	529.0	5.5	483	35	-10	11.67	1.1	.0581	0.7	11.69	1.1	.0568	1.6	0.67	2.2	.0855	1.1	.705
3.1	0.57	111	5	0.05	8.6	548.9	8.8	538	85	-2	11.19	1.6	.0628	2.6	11.25	1.7	.0582	3.9	0.71	4.5	.0889	1.7	.506
4.1	0.01	527	241	0.47	166.8	2021.5	20.3	2059	16	2	2.71	1.1	.1273	0.5	2.72	1.2	.1271	0.9	6.46	1.8	.3683	1.2	.906
5.1	0.82	58	1	0.01	4.2	521.5	10.3	485	104	-8	11.77	2.0	.0635	3.6	11.87	2.0	.0568	4.7	0.66	5.3	.0843	2.0	.477
6.1	0.09	1510	129	0.09	107.6	513.3	5.4	493	24	-4	12.05	1.1	.0578	0.7	12.07	1.1	.0570	1.1	0.65	1.7	.0829	1.1	.780
7.1	0.56	102	2	0.02	7.7	539.9	8.4	563	69	4	11.38	1.6	.0634	2.6	11.45	1.6	.0589	3.2	0.71	3.7	.0874	1.6	.522
8.1	0.67	63	4	0.06	5.0	560.6	10.3	536	107	-5	10.93	1.9	.0637	3.2	11.01	1.9	.0582	4.9	0.73	5.6	.0909	1.9	.495
8.2	0.10	571	25	0.05	41.3	521.2	5.8	516	30	-1	11.86	1.1	.0584	1.2	11.88	1.2	.0576	1.4	0.67	1.9	.0842	1.2	.689
9.1	0.08	778	71	0.09	57.4	530.9	5.7	509	26	-4	11.64	1.1	.0581	0.9	11.65	1.1	.0575	1.2	0.68	1.8	.0858	1.1	.763
10.1	0.06	1082	105	0.10	77.4	515.7	5.4	490	25	-5	12.00	1.1	.0574	0.8	12.01	1.1	.0570	1.1	0.65	1.8	.0833	1.1	.772
11.1	0.11	105	18	0.18	8.2	562.9	8.6	517	85	-9	10.95	1.5	.0585	2.9	10.96	1.6	.0577	3.9	0.73	4.5	.0912	1.6	.542
12.1	0.74	83	2	0.02	6.1	526.0	8.6	514	81	-2	11.68	1.7	.0636	2.8	11.76	1.7	.0576	3.7	0.68	4.2	.0850	1.7	.500
12.2	0.18	223	14	0.06	16.2	524.3	6.7	590	47	11	11.78	1.3	.0611	1.8	11.80	1.3	.0596	2.2	0.70	2.7	.0847	1.3	.597
14.1	0.52	119	12	0.10	9.2	551.5	8.1	525	75	-5	11.14	1.5	.0622	2.5	11.20	1.5	.0579	3.4	0.71	4.0	.0893	1.5	.538
15.1	0.39	125	6	0.05	9.7	554.1	8.1	559	61	1	11.10	1.5	.0620	2.3	11.14	1.5	.0588	2.8	0.73	3.4	.0898	1.5	.549
15.2	-0.06	446	28	0.06	34.7	558.6	6.2	579	29	3	11.05	1.1	.0588	1.2	11.05	1.2	.0593	1.3	0.74	1.9	.0905	1.2	.706

Errors are 1-sigma; Pb_c and Pb^* indicate the common and radiogenic portions, respectively.

Error in Standard calibration was 0.54% (not included in above errors but required when comparing data from different mounts).

(3) Common Pb corrected by assuming $^{206}Pb/^{238}U$-$^{208}Pb/^{232}Th$ age-concordance

Summary of SHRIMP U-Pb titanite data for sample LKR021

Grain.Spot	% $^{206}Pb_c$	ppm U	ppm Th	$^{232}Th/^{238}U$	ppm $^{206}Pb^*$	(1) $^{206}Pb/^{238}U$ Age		(1) $^{207}Pb/^{206}Pb$ Age		% Dis-cor-dant	Total $^{238}U/^{206}Pb$	±%	Total $^{207}Pb/^{206}Pb$	±%	(1) $^{238}U/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{235}U$	±%	(1) $^{206}Pb^*/^{238}U$	±%	err corr
2.1	1.81	208	103	0.51	14.3	488.2	± 7.4	559	± 110	13	12.48	1.5	0.07345	1.2	12.71	1.6	0.0588	4.9	0.638	5.2	0.0787	1.6	.305
3.1	0.83	375	500	1.38	25.8	492.7	± 8.5	597	± 49	17	12.49	1.8	0.06651	1.1	12.59	1.8	0.0598	2.2	0.655	2.9	0.0794	1.8	.623
5.1	0.96	503	408	0.84	34.2	487.2	± 5.9	441	± 53	-10	12.61	1.2	0.06355	0.82	12.74	1.3	0.0557	2.4	0.603	2.7	0.07851	1.3	.467
6.1	0.80	366	220	0.62	25.6	499.6	± 6.5	560	± 61	11	12.31	1.3	0.06527	0.95	12.41	1.3	0.0588	2.8	0.653	3.1	0.0806	1.3	.431
7.1	1.71	306	230	0.78	48.7	1080	±14	1002	± 54	-8	5.387	1.4	0.08698	0.68	5.481	1.5	0.0726	2.7	1.826	3	0.1824	1.5	.478
8.1	1.04	501	355	0.73	34.9	496.9	± 6	418	± 54	-19	12.35	1.2	0.06361	0.83	12.48	1.3	0.0552	2.4	0.609	2.7	0.0801	1.3	.463
9.1	0.58	721	824	1.18	48.5	483.3	± 5.5	516	± 34	6	12.77	1.2	0.0623	0.7	12.85	1.2	0.05763	1.5	0.619	1.9	0.07785	1.2	.610
10.1	10.14	31	22	0.72	2.17	452	±17	590	± 590	23	12.37	3.2	0.1414	2.9	13.77	3.8	0.0596	27	0.600	28	0.0726	3.8	.137
10.2	13.24	25	20	0.81	1.87	466	±20	90	±1100	-418	11.58	3.5	0.1564	2.5	13.35	4.6	0.048	47	0.49	47	0.0749	4.6	.097
11.1	0.98	455	458	1.04	30.8	484.2	± 6.3	466	± 55	-4	12.69	1.3	0.06434	1.2	12.82	1.3	0.0563	2.5	0.606	2.8	0.078	1.3	.480
12.1	1.54	353	96	0.28	23.2	468.2	± 6.2	390	± 77	-20	13.07	1.3	0.06699	0.98	13.28	1.4	0.0545	3.4	0.566	3.7	0.0753	1.4	.370
16.1	1.42	209	97	0.48	14.8	505.1	± 7.1	549	± 79	8	12.09	1.4	0.07002	1.1	12.27	1.5	0.0585	3.6	0.658	3.9	0.0815	1.5	.375
17.1	0.83	379	141	0.39	26.6	501.1	± 6.1	549	± 46	9	12.27	1.3	0.06527	0.83	12.37	1.3	0.0585	2.1	0.652	2.5	0.0808	1.3	.515

Errors are 1-sigma; Pb_c and Pb^* indicate the common and radiogenic portions, respectively.
Error in Standard calibration was 0.40% (not included in above errors but required when comparing data from different mounts).
(1) Common Pb corrected using measured ^{204}Pb.

Summary of SHRIMP U-Pb zircon data for sample ACAM-1

Grain.Spot	% $^{206}Pb_c$	ppm U	ppm Th	$^{232}Th/^{238}U$	ppm $^{206}Pb^*$	(1) $^{206}Pb/^{238}U$ Age		(1) $^{207}Pb/^{206}Pb$ Age		% Dis-cor-dant	(1) $^{207}Pb^*/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{235}U$	±%	(1) $^{206}Pb^*/^{238}U$	±%	err corr
1.1	0.02	602	203	0.35	190	2017	±18	2026.3	±3.4	0	0.12482	0.19	6.323	1.1	0.3674	1	.983
2.1	0.03	178	68	0.39	56.1	2017	±21	2023.8	±6.5	0	0.12465	0.36	6.315	1.3	0.3674	1.2	.957
3.1	0.00	626	195	0.32	200	2036	±18	2031.4	±3.3	0	0.12518	0.18	6.409	1	0.3713	1	.984
4.1	0.00	636	193	0.31	207	2072	±18	2029.3	±3.4	-2	0.12504	0.19	6.536	1	0.3791	1	.983
5.1	0.12	157	49	0.32	46.5	1907	±18	2024.8	±8.1	6	0.12472	0.46	5.919	1.2	0.3442	1.1	.921
5.2	0.52	843	30	0.04	131	1065	±10	1751.8	±8.6	39	0.10717	0.47	2.654	1.1	0.1796	1	.910
6.1	0.02	375	126	0.35	118	2018	±18	2031.2	±4.7	1	0.12517	0.26	6.344	1.1	0.3676	1	.969
7.1	0.01	525	170	0.33	169	2048	±18	2028.6	±3.7	-1	0.12499	0.21	6.446	1.1	0.3741	1	.980
4.1	0.01	491	139	0.29	155	2014	±18	2032.5	±3.7	1	0.12526	0.21	6.333	1.1	0.3667	1	.980
8.1	0.01	417	104	0.26	130	1995	±19	2015.5	±4.3	1	0.12407	0.24	6.205	1.1	0.3627	1.1	.975
9.1	0.03	821	300	0.38	255	1990	±18	2022.1	±3.2	2	0.12453	0.18	6.21	1.1	0.3617	1	.985
10.1	0.01	578	148	0.27	184	2030	±18	2025.5	±3.6	0	0.12477	0.21	6.369	1.1	0.3702	1	.981
11.1	0.01	433	123	0.29	137	2022	±18	2022.4	±4.2	0	0.12455	0.24	6.327	1.1	0.3684	1	.975
12.1	0.05	139	58	0.43	45.4	2071	±20	2021.2	±7.8	-2	0.12447	0.44	6.501	1.2	0.3788	1.1	.929
13.1	0.00	509	126	0.26	167	2079	±18	2028.3	±3.8	-2	0.12496	0.21	6.559	1.1	0.3807	1	.979
14.1	0.03	308	90	0.30	96.1	1996	±18	2023.5	±5.3	1	0.12463	0.3	6.235	1.1	0.3628	1.1	.963
15.1	0.00	672	241	0.37	213	2025	±19	2029.9	±3.9	0	0.12508	0.22	6.365	1.1	0.3691	1.1	.979
15.2	--	760	35	0.05	209	1790	±16	1818.5	±3.5	2	0.11116	0.2	4.905	1	0.32	1	.982
16.1	0.03	410	165	0.42	125	1950	±20	2031.2	±4.7	4	0.12517	0.26	6.097	1.2	0.3532	1.2	.977

Errors are 1-sigma; Pb_c and Pb^* indicate the common and radiogenic portions, respectively.
Error in Standard calibration was 0.25% (not included in above errors but required when comparing data from different mounts).
(1) Common Pb corrected using measured ^{204}Pb.

Summary of SHRIMP U-Pb data for zircons from sample LKR016

Grain.Spot	% $^{206}Pb_c$	ppm U	ppm Th	$^{232}Th/^{238}U$	ppm $^{206}Pb^*$	(1) $^{206}Pb/^{238}U$ Age		(1) $^{207}Pb/^{206}Pb$ Age		% Dis-cor-dant	Total $^{238}U/^{206}Pb$	±%	Total $^{207}Pb/^{206}Pb$	±%	(1) $^{238}U/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{235}U$	±%	(1) $^{206}Pb^*/^{238}U$	±%	err corr
1.1	1.74	1847	247	0.14	136	519.5	± 5.8	514	±71	-1	11.71	1.2	0.0717	2.1	11.92	1.2	0.0576	3.2	0.666	3.4	0.08392	1.2	.340
2.1	0.70	945	883	0.97	114	841.3	± 8.4	904	±25	7	7.124	1.1	0.07496	0.64	7.174	1.1	0.06918	1.2	1.33	1.6	0.1394	1.1	.664
3.1	0.01	866	329	0.39	100	815.6	± 8.1	886	±13	8	7.413	1.1	0.06864	0.61	7.414	1.1	0.06857	0.61	1.275	1.2	0.1349	1.1	.867
4.1	--	976	29	0.03	71.7	529.9	± 5.5	534	±19	1	11.68	1.1	0.05749	0.86	11.67	1.1	0.05811	0.85	0.6864	1.4	0.08567	1.1	.785
5.1	--	128	144	1.16	41.2	2050	±23	2037	±13	-1	2.674	1.3	0.12453	0.75	2.671	1.3	0.12555	0.74	6.481	1.5	0.3744	1.3	.869
6.1	0.25	481	236	0.51	131	1769	±17	1980.3	± 8.8	11	3.159	1.1	0.12381	0.4	3.167	1.1	0.12163	0.5	5.296	1.2	0.3158	1.1	.909
7.1	--	264	457	1.79	38.7	1018	±11	1043	±21	2	5.85	1.2	0.07351	0.97	5.846	1.2	0.07407	1.1	1.747	1.6	0.171	1.2	.746
7.2	0.91	1099	698	0.66	113	723	± 7.2	802	±27	10	8.349	1.1	0.0734	0.56	8.426	1.1	0.06586	1.3	1.078	1.7	0.1187	1.1	.630
8.1	0.01	906	20	0.02	67.1	533.3	± 5.6	528	±18	-1	11.59	1.1	0.05802	0.8	11.59	1.1	0.05796	0.81	0.6892	1.4	0.08625	1.1	.804
9.1	--	876	384	0.45	112	895.9	± 9	952	±11	6	6.71	1.1	0.07043	0.56	6.707	1.1	0.07081	0.56	1.456	1.2	0.1491	1.1	.888
10.1	0.96	1461	70	0.05	118	572.8	± 6.2	627	±31	9	10.66	1.1	0.06846	0.56	10.76	1.1	0.06065	1.4	0.777	1.8	0.0929	1.1	.622
11.1	0.43	1371	5580	4.20	87.4	459.7	± 4.7	485	±28	5	13.47	1.1	0.0603	0.7	13.53	1.1	0.05682	1.3	0.5792	1.6	0.07392	1.1	.646
12.1	--	1093	37	0.04	92.6	606.8	± 6.2	664	±19	9	10.14	1.1	0.06121	0.9	10.13	1.1	0.0617	0.89	0.84	1.4	0.0987	1.1	.770
13.1	--	347	207	0.62	48.2	967	±10	1003	±17	4	6.183	1.1	0.07169	0.87	6.176	1.1	0.0726	0.86	1.621	1.4	0.1619	1.1	.801
14.1	--	594	132	0.23	79.2	930.2	± 9.5	967	±15	4	6.444	1.1	0.07107	0.7	6.442	1.1	0.07132	0.72	1.526	1.3	0.1552	1.1	.834
15.1	--	993	308	0.32	139	975.6	± 9.5	994	±10	2	6.122	1.1	0.07196	0.51	6.12	1.1	0.07228	0.5	1.628	1.2	0.1634	1.1	.903
16.1	0.04	1711	31	0.02	148	618.4	± 6.1	675	±12	8	9.93	1	0.06232	0.53	9.93	1	0.06202	0.55	0.861	1.2	0.1007	1	.884
16.2	--	774	18	0.02	58	538.7	± 6.1	570	±19	5	11.48	1.2	0.05893	0.88	11.47	1.2	0.05908	0.89	0.71	1.5	0.0872	1.2	.801
17.1	1.25	1135	343	0.31	85.8	536.9	± 5.6	520	±46	-3	11.37	1.1	0.06793	0.84	11.51	1.1	0.0577	2.1	0.691	2.4	0.08686	1.1	.457
18.1	0.03	692	280	0.42	104	1040	±10	1027	±12	-1	5.711	1.1	0.07368	0.58	5.713	1.1	0.07346	0.59	1.773	1.2	0.175	1.1	.875
19.1	--	206	134	0.67	69.1	2129	±22	2049	±10	-4	2.557	1.2	0.1262	0.58	2.556	1.2	0.12646	0.59	6.822	1.3	0.3912	1.2	.898
19.2	--	970	38	0.04	79.3	586.1	± 6.1	719	±15	18	10.51	1.1	0.06323	0.72	10.51	1.1	0.06333	0.72	0.831	1.3	0.0952	1.1	.833

Errors are 1-sigma; Pb_c and Pb^* indicate the common and radiogenic portions, respectively.

Error in Standard calibration was 0.28% (not included in above errors but required when comparing data from different mounts).

(1) Common Pb corrected using measured ^{204}Pb.

Summary of SHRIMP U-Pb monazite data for sample LKR016.

Grain.Spot	% $^{206}Pb_c$	ppm U	ppm Th	$^{232}Th/^{238}U$	ppm $^{206}Pb^*$	(1) $^{206}Pb/^{238}U$ Age		(1) $^{207}Pb/^{206}Pb$ Age		% Dis-cor-dant	Total $^{238}U/^{206}Pb$	±%	Total $^{207}Pb/^{206}Pb$	±%	(1) $^{238}U/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{235}U$	±%	(1) $^{206}Pb^*/^{238}U$	±%	err corr
1.1	--	4758	51216	11.1	353	534.3	±7.5	544	±31	2	11.58	1.5	0.05799	1.4	11.57	1.5	0.05837	1.4	0.695	2	0.0864	1.5	.717
1.2	--	3044	69737	23.7	228	538.5	±8	529	±31	-2	11.49	1.5	0.05749	1.3	11.48	1.5	0.05799	1.4	0.697	2.1	0.0871	1.5	.739
2.1	--	2383	61268	26.6	177	535.8	±8	528	±34	-1	11.54	1.6	0.05782	1.5	11.54	1.6	0.05794	1.5	0.692	2.2	0.0867	1.6	.712
2.2	--	3081	87844	29.5	225	526.4	±7.7	545	±31	3	11.77	1.5	0.05689	1.5	11.75	1.5	0.05841	1.4	0.685	2.1	0.0851	1.5	.734
4.1	0.03	3108	98199	32.6	221	513.4	±7.4	521	±33	1	12.06	1.5	0.05799	1.5	12.06	1.5	0.05777	1.5	0.66	2.1	0.0829	1.5	.706
5.1	--	4089	106549	26.9	309	543.6	±7.7	531	±25	-2	11.38	1.5	0.05704	1.2	11.37	1.5	0.05803	1.2	0.704	1.9	0.088	1.5	.786
6.1	--	2588	80750	32.2	184	512.6	±9	539	±35	5	12.09	1.8	0.0579	1.6	12.08	1.8	0.05823	1.6	0.664	2.4	0.0828	1.8	.748
6.2	--	5990	67923	11.7	452	543.7	±7.6	538	±21	-1	11.37	1.5	0.05753	0.98	11.36	1.5	0.05822	0.97	0.706	1.7	0.088	1.5	.831
7.1	0.02	6144	46491	7.8	469	549.1	±7.5	520	±18	-6	11.25	1.4	0.05794	0.81	11.25	1.4	0.05775	0.82	0.708	1.6	0.0889	1.4	.866
7.2	--	2268	76320	34.8	171	543.8	±8	546	±31	0	11.38	1.5	0.05691	1.5	11.36	1.5	0.05843	1.4	0.709	2.1	0.088	1.5	.731
22.1	--	1233	39837	33.4	91.8	536.1	±8.2	552	±37	3	11.54	1.6	0.05832	1.7	11.53	1.6	0.05859	1.7	0.701	2.3	0.0867	1.6	.689
22.2	--	3576	101830	29.4	270	543.2	±7.7	550	±26	1	11.38	1.5	0.05818	1.2	11.37	1.5	0.05853	1.2	0.71	1.9	0.0879	1.5	.778
23.1	--	1672	73565	45.5	126	541.2	±8.2	558	±33	3	11.43	1.6	0.0582	1.5	11.42	1.6	0.05875	1.5	0.709	2.2	0.0876	1.6	.719
23.2	--	2568	88033	35.4	186	521.2	±7.6	534	±27	2	11.89	1.5	0.05696	1.3	11.88	1.5	0.05811	1.2	0.675	2	0.0842	1.5	.773

Errors are 1-sigma; Pb_c and Pb^* indicate the common and radiogenic portions, respectively.

Error in Standard calibration was 0.69% (not included in above errors but required when comparing data from different mounts).

(1) Common Pb corrected using measured ^{204}Pb.

Summary of SHRIMP U-Pb zircon data for sample LHA010

Grain.Spot	% $^{206}Pb_c$	ppm U	ppm Th	$^{232}Th/^{238}U$	ppm $^{206}Pb^*$	(1) $^{206}Pb/^{238}U$ Age		(1) $^{207}Pb/^{206}Pb$ Age		% Dis-cor-dant	Total $^{238}U/^{206}Pb$	±%	Total $^{207}Pb/^{206}Pb$	±%	(1) $^{238}U/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{235}U$	±%	(1) $^{206}Pb^*/^{238}U$	±%	err corr
1.1	--	451	160	0.37	32.4	517.4	± 5.6	520	±26	1	11.97	1.1	0.05737	1.2	11.97	1.1	0.05773	1.2	0.665	1.6	0.08357	1.1	.692
2.1	1.00	450	207	0.48	33.4	529.7	± 5.9	516	±62	-3	11.56	1.1	0.06578	0.99	11.68	1.2	0.0576	2.8	0.681	3.1	0.08564	1.2	.379
2.2	0.47	2400	1998	0.86	146	438.9	± 4.5	481	±20	9	14.13	1.1	0.06049	0.44	14.19	1.1	0.05672	0.88	0.5509	1.4	0.07045	1.1	.768
3.1	0.07	1176	677	0.59	86.5	529.2	± 5.5	530	±17	0	11.68	1.1	0.0586	0.61	11.69	1.1	0.058	0.75	0.6842	1.3	0.08555	1.1	.819
4.1	0.08	316	131	0.43	23	525.1	± 6	497	±30	-6	11.77	1.2	0.05775	1.2	11.78	1.2	0.05714	1.4	0.669	1.8	0.0849	1.2	.658
5.1	0.06	1577	653	0.43	112	509.6	± 5.8	514	±14	1	12.15	1.2	0.05807	0.55	12.16	1.2	0.05757	0.62	0.653	1.3	0.08226	1.2	.886
5.2	0.25	2251	1601	0.73	129	416.2	± 4.3	477	±18	13	14.96	1.1	0.05863	0.49	14.99	1.1	0.05663	0.83	0.5208	1.3	0.0667	1.1	.785
6.1	0.71	408	232	0.59	29.6	518.1	± 5.8	521	±57	1	11.86	1.2	0.06355	1	11.95	1.2	0.0578	2.6	0.667	2.8	0.08369	1.2	.412
7.1	0.06	2134	1300	0.63	134	452.9	± 4.7	518	±15	13	13.73	1.1	0.05817	0.52	13.74	1.1	0.05768	0.7	0.5788	1.3	0.07278	1.1	.837
7.2	0.12	587	274	0.48	41.5	509.1	± 5.5	524	±26	3	12.15	1.1	0.05884	0.94	12.17	1.1	0.05784	1.2	0.655	1.6	0.08218	1.1	.688
8.1	0.10	307	253	0.85	22	516.9	± 6.1	506	±33	-2	11.97	1.2	0.05819	1.3	11.98	1.2	0.05738	1.5	0.66	1.9	0.0835	1.2	.629
9.2	0.00	1059	391	0.38	74.7	508.3	± 6	515	±20	1	12.19	1.2	0.0576	0.92	12.19	1.2	0.0576	0.92	0.652	1.5	0.082	1.2	.802
9.1	0.01	1930	28	0.02	534	1799	±18	1869.7	± 3.8	4	3.106	1.2	0.11444	0.21	3.106	1.2	0.11436	0.21	5.076	1.2	0.322	1.2	.984
10.1	0.00	251	196	0.81	18.6	532.1	± 6.4	536	±33	1	11.62	1.3	0.05816	1.5	11.62	1.3	0.05816	1.5	0.69	1.9	0.086	1.3	.646
11.1	0.03	2207	2108	0.99	163	531.8	± 6.4	518	±12	-3	11.62	1.2	0.05794	0.5	11.63	1.2	0.05769	0.55	0.684	1.4	0.086	1.2	.914
11.2	0.31	995	316	0.33	73.6	530.7	± 6.4	551	±29	4	11.62	1.3	0.0611	0.96	11.65	1.3	0.05857	1.4	0.693	1.8	0.0858	1.3	.683
12.1	0.24	1268	780	0.64	111	626.2	± 6.4	701	±19	11	9.78	1.1	0.06473	0.58	9.8	1.1	0.06279	0.87	0.883	1.4	0.102	1.1	.778
12.2	0.29	4627	1293	0.29	244	382.9	± 3.9	434	±17	12	16.29	1.1	0.05784	0.43	16.34	1.1	0.05554	0.75	0.4686	1.3	0.06119	1.1	.813
13.1	0.14	1909	1105	0.60	137	517.8	± 5.3	522	±19	1	11.94	1.1	0.05897	0.64	11.96	1.1	0.0578	0.89	0.6665	1.4	0.08364	1.1	.770
14.1	--	853	353	0.43	120	979.5	± 9.9	1025	±15	4	6.094	1.1	0.07338	0.72	6.094	1.1	0.07338	0.72	1.66	1.3	0.1641	1.1	.836
14.2	0.00	611	381	0.64	42.5	501.2	± 5.5	532	±23	6	12.37	1.1	0.05805	1	12.37	1.1	0.05805	1	0.6472	1.5	0.08085	1.1	.741
15.1	0.14	1068	380	0.37	63	427.3	± 4.5	508	±23	16	14.57	1.1	0.05857	0.81	14.59	1.1	0.05742	1	0.5425	1.5	0.06852	1.1	.731
16B.1	0.60	1678	722	0.44	118	504.4	± 5.2	514	±30	2	12.21	1.1	0.06246	0.64	12.29	1.1	0.05758	1.4	0.646	1.7	0.08139	1.1	.621
17.1	0.00	882	382	0.45	64.2	524.4	± 5.6	523	±18	0	11.8	1.1	0.05782	0.8	11.8	1.1	0.05782	0.8	0.6756	1.4	0.08474	1.1	.808
18.1	0.07	417	131	0.33	151	2268	±25	2014.1	± 8.4	-13	2.37	1.3	0.12459	0.44	2.371	1.3	0.12397	0.48	7.21	1.4	0.4217	1.3	.941
19.1	0.47	284	102	0.37	20.4	515.8	± 6.2	538	±56	4	11.95	1.2	0.06203	1.4	12.01	1.2	0.0582	2.6	0.669	2.9	0.0833	1.2	.437
19.2	0.06	3111	942	0.31	223	516.9	± 5.2	528	±11	2	11.97	1.1	0.05842	0.43	11.98	1.1	0.05795	0.5	0.6671	1.2	0.08349	1.1	.904
20.1	0.13	239	135	0.58	17.2	518.4	± 6.4	543	±41	5	11.93	1.3	0.05943	1.6	11.94	1.3	0.0584	1.9	0.674	2.3	0.0837	1.3	.567
20.2	0.07	4085	2418	0.61	225	400.5	± 4.1	470	±11	15	15.59	1.1	0.05705	0.42	15.6	1.1	0.05645	0.49	0.4988	1.2	0.06409	1.1	.907
21.1	0.16	204	198	1.00	14.7	517.7	± 6.6	510	±44	-2	11.94	1.3	0.05881	1.7	11.96	1.3	0.0575	2	0.663	2.4	0.0836	1.3	.548

Errors are 1-sigma; Pb_c and Pb^* indicate the common and radiogenic portions, respectively.

Error in Standard calibration was 0.34% (not included in above errors but required when comparing data from different mounts).

(1) Common Pb corrected using measured ^{204}Pb.

Summary of SHRIMP data for zircons from sample LHA012

Grain.Spot	% $^{206}Pb_c$	ppm U	ppm Th	$^{232}Th/^{238}U$	ppm $^{206}Pb^*$	(1) $^{206}Pb/^{238}U$ Age		(1) $^{207}Pb/^{206}Pb$ Age		% Dis-cor-dant	Total $^{238}U/^{206}Pb$	±%	Total $^{207}Pb/^{206}Pb$	±%	(1) $^{238}U/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{235}U$	±%	(1) $^{206}Pb^*/^{238}U$	±%	err corr
1.1	0.09	858	353	0.43	62.7	525.8	±6.1	529	±24	1	11.76	1.2	0.05868	0.96	11.77	1.2	0.05798	1.1	0.679	1.6	0.085	1.2	.743
1.2	0.03	1779	597	0.35	132	533.4	±5.5	518	±14	-3	11.59	1.1	0.05794	0.57	11.59	1.1	0.05769	0.62	0.6861	1.2	0.08626	1.1	.866
2.1	0.00	1096	595	0.56	79.2	520.7	±5.5	526	±16	1	11.89	1.1	0.0579	0.74	11.89	1.1	0.0579	0.74	0.6716	1.3	0.08412	1.1	.829
3.2	0.03	4263	182	0.04	308	520.1	±5.5	518.7	± 9	0	11.9	1.1	0.05793	0.39	11.9	1.1	0.05771	0.41	0.6686	1.2	0.08402	1.1	.938
3.1	0.29	1093	120	0.11	77.2	508	±5.3	503	±28	-1	12.16	1.1	0.05969	0.75	12.2	1.1	0.0573	1.3	0.648	1.7	0.08199	1.1	.656
4.1	0.22	1093	567	0.54	78.7	518.1	±5.4	543	±24	5	11.92	1.1	0.06015	0.72	11.95	1.1	0.05834	1.1	0.673	1.5	0.08368	1.1	.712
5.1	0.05	842	333	0.41	60.7	519.1	±5.5	496	±21	-5	11.92	1.1	0.0575	0.85	11.92	1.1	0.05712	0.94	0.6605	1.5	0.08386	1.1	.763
6.1	0.04	1579	325	0.21	113	516.7	±5.3	518	±15	0	11.98	1.1	0.05802	0.63	11.98	1.1	0.05769	0.69	0.6638	1.3	0.08346	1.1	.844
7.1	0.08	662	237	0.37	48.4	526.7	±5.7	505	±25	-4	11.74	1.1	0.05798	0.96	11.75	1.1	0.05736	1.1	0.673	1.6	0.08514	1.1	.703
8.1	0.22	960	642	0.69	65.4	490.8	±5.2	512	±28	4	12.61	1.1	0.0593	0.81	12.64	1.1	0.05752	1.3	0.627	1.7	0.07911	1.1	.653
8.2	0.14	1323	471	0.37	96	522	±5.4	495	±20	-5	11.84	1.1	0.05825	0.67	11.86	1.1	0.05709	0.9	0.6639	1.4	0.08434	1.1	.769
9.2	0.29	1686	759	0.47	109	466.4	±4.9	522	±28	11	13.29	1.1	0.06018	0.93	13.33	1.1	0.05779	1.3	0.598	1.7	0.07502	1.1	.648
9.1	0.02	1505	548	0.38	108	517.8	±5.9	538	±15	4	11.96	1.2	0.05839	0.67	11.96	1.2	0.05823	0.68	0.6714	1.4	0.08363	1.2	.867
10.2	0.14	1185	338	0.29	72.1	440.5	±4.7	514	±23	14	14.12	1.1	0.05867	0.76	14.14	1.1	0.05757	1	0.5614	1.5	0.07072	1.1	.729

Errors are 1-sigma; Pb_c and Pb^* indicate the common and radiogenic portions, respectively.

Error in Standard calibration was 0.34% (not included in above errors but required when comparing data from different mounts).

(1) Common Pb corrected using measured ^{204}Pb.

Summary of SHRIMP U-Pb zircon data for sample LCZ7-2

Grain.Spot	% $^{206}Pb_c$	ppm U	ppm Th	$^{232}Th/^{238}U$	ppm $^{206}Pb^*$	(3) $^{206}Pb/^{238}U$ Age		(3) $^{207}Pb/^{206}Pb$ Age		% Dis-cor-dant	(3) $^{238}U/^{206}Pb^*$	±%	(3) $^{207}Pb^*/^{206}Pb^*$	±%	(3) $^{207}Pb^*/^{235}U$	±%	(3) $^{206}Pb^*/^{238}U$	±%	err corr
1.1	5.56	3643	109	0.03	241	447.8	±5	460	± 120	2	13.9	1.2	0.0562	5.5	0.557	6.2	0.07193	1.2	.634
2.1	6.25	3602	98	0.03	199	372.1	±4.2	414	± 140	10	16.83	1.2	0.055	6.2	0.451	6.9	0.05943	1.2	.642
3.1	9.73	2997	68	0.02	189	410.8	±5.8	420	± 220	1	15.2	1.5	0.0552	9.8	0.501	11	0.0658	1.5	.680
4.1	8.29	2182	78	0.04	153	462.7	±5.7	542	± 220	16	13.44	1.3	0.0583	10	0.599	11	0.07441	1.3	.617
5.1	0.39	2411	71	0.03	179	531	±5.4	524	± 14	-1	11.65	1.1	0.05786	0.65	0.6849	1.4	0.08585	1.1	.888
6.1	2.02	3262	155	0.05	204	443.5	±5.6	505	± 78	13	14.04	1.3	0.0573	3.6	0.563	4.1	0.07121	1.3	.545
7.1	0.51	2322	77	0.03	175	539.2	±5.4	531	± 23	-2	11.46	1	0.05803	1.1	0.698	1.6	0.08723	1	.769
8.1	5.36	2793	79	0.03	171	420.1	±4.7	483	± 160	14	14.85	1.2	0.0568	7.4	0.527	8	0.06734	1.2	.540
9.1	1.00	2357	52	0.02	162	492	±4.9	519	± 19	5	12.61	1	0.05771	0.89	0.6311	1.5	0.07931	1	.833
10.1	8.66	4055	167	0.04	230	371.6	±4.7	409	± 230	8	16.85	1.3	0.0549	10	0.449	11	0.05933	1.3	.658
11.1	16.84	5642	123	0.02	346	342	±6.6	-720	±1100	-294	18.35	2	0.035	41	0.26	42	0.0545	2	.871
12.1	2.37	4066	121	0.03	256	443.7	±4.6	493	± 63	11	14.03	1.1	0.057	2.9	0.56	3.4	0.07125	1.1	.583
13.1	8.99	4841	158	0.03	278	372.8	±5	331	± 320	-13	16.8	1.4	0.053	14	0.435	15	0.05954	1.4	.662
14.1	5.10	3117	106	0.04	240	522.2	±6.1	486	± 190	-8	11.85	1.2	0.0569	8.5	0.661	9.1	0.0844	1.2	.518
15.1	1.36	4185	141	0.03	241	412.7	±4.2	461	± 29	11	15.13	1	0.05622	1.3	0.5124	1.9	0.06611	1	.754
16.1	3.24	1765	54	0.03	132	521.3	±5.6	525	± 72	1	11.87	1.1	0.0579	3.3	0.672	3.8	0.08422	1.1	.581

Errors are 1-sigma; Pb_c and Pb^* indicate the common and radiogenic portions, respectively.
Error in Standard calibration was 0.25% (not included in above errors but required when comparing data from different mounts).
(3) Common Pb corrected by assuming $^{206}Pb/^{238}U$-$^{208}Pb/^{232}Th$ age-concordance

Summary of SHRIMP U-Pb data for zircons from sample LID038

Grain.Spot	% $^{206}Pb_c$	ppm U	ppm Th	$^{232}Th/^{238}U$	ppm $^{206}Pb^*$	(1) $^{206}Pb/^{238}U$ Age		(1) $^{207}Pb/^{206}Pb$ Age		% Dis-cor-dant	Total $^{238}U/^{206}Pb$	±%	Total $^{207}Pb/^{206}Pb$	±%	(1) $^{238}U/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{235}U$	±%	(1) $^{206}Pb^*/^{238}U$	±%	err corr
2.1	0.16	850	214	0.26	63.1	533.1	± 5.5	523	±24	-2	11.58	1.1	0.05911	0.82	11.6	1.1	0.05781	1.1	0.687	1.5	0.08622	1.1	.708
3.1	0.17	1233	117	0.10	151	856	±12	995	±41	14	7.03	1.5	0.0737	1.9	7.04	1.5	0.0723	2	1.416	2.5	0.142	1.5	.591
4.1	2.40	814	5	0.01	59.8	516.3	± 5.6	524	±81	1	11.7	1.1	0.0773	1.5	11.99	1.1	0.0578	3.7	0.665	3.9	0.08339	1.1	.291
5.1	0.22	942	7	0.01	67.6	516	± 5.3	497	±27	-4	11.97	1.1	0.05894	0.92	12	1.1	0.05714	1.2	0.657	1.6	0.08333	1.1	.654
6.1	0.00	965	9	0.01	67.9	507.5	± 5.3	467	±27	-9	12.21	1.1	0.05637	1.2	12.21	1.1	0.05637	1.2	0.637	1.6	0.08191	1.1	.672
7.1	0.14	2143	27	0.01	122	411.8	± 4.2	463	±17	11	15.14	1	0.05737	0.58	15.16	1	0.05628	0.76	0.5118	1.3	0.06596	1.0	.809
8.1	0.06	1604	7	0.00	117	522.9	± 5.2	515	±15	-2	11.83	1	0.05808	0.61	11.83	1	0.0576	0.69	0.6711	1.3	0.0845	1.0	.833
9.1	2.06	2318	24	0.01	143	436.7	± 4.5	482	±91	9	13.97	1	0.07344	0.47	14.27	1.1	0.0567	4.1	0.548	4.2	0.07008	1.1	.253
10.1	0.99	2504	75	0.03	246	692	± 7.2	1467	±13	53	8.737	1.1	0.09984	0.39	8.825	1.1	0.09198	0.69	1.437	1.3	0.1133	1.1	.846
11.1	0.35	1302	63	0.05	111	609.5	± 6.1	867	±21	30	10.05	1.1	0.07074	0.74	10.08	1.1	0.06794	10	0.929	1.5	0.0992	1.1	.727
12.1	0.00	1083	9	0.01	77.5	515.7	± 5.3	497	±28	-4	12.01	1.1	0.05714	1.3	12.01	1.1	0.05714	1.3	0.656	1.6	0.08328	1.1	.646
13.1	0.03	1001	6	0.01	73.8	530.8	± 5.4	507	±18	-5	11.65	1.1	0.05767	0.77	11.65	1.1	0.05739	0.81	0.6792	1.3	0.08583	1.1	.797
14.1	0.00	782	6	0.01	55.8	514.5	± 5.3	496	±19	-4	12.04	1.1	0.05713	0.87	12.04	1.1	0.05713	0.87	0.6544	1.4	0.08308	1.1	.778
15.1	0.07	437	251	0.59	99.8	1518	±15	1748	±20	13	3.764	1.1	0.1076	1	3.767	1.1	0.107	1.1	3.915	1.6	0.2655	1.1	.717

Errors are 1-sigma; Pb_c and Pb^* indicate the common and radiogenic portions, respectively.
Error in Standard calibration was 0.27% (not included in above errors but required when comparing data from different mounts).
(1) Common Pb corrected using measured ^{204}Pb.

Summary of SHRIMP U-Pb data for monazites from sample LID038

Grain.Spot	% $^{206}Pb_c$	ppm U	ppm Th	$^{232}Th/^{238}U$	ppm $^{206}Pb^*$	(1) $^{206}Pb/^{238}U$ Age		(1) $^{207}Pb/^{206}Pb$ Age		% Dis-cor-dant	Total $^{238}U/^{206}Pb$	±%	Total $^{207}Pb/^{206}Pb$	±%	(1) $^{238}U/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{235}U$	±%	(1) $^{206}Pb^*/^{238}U$	±%	err corr
1.1	0.00	5851	33679	5.9	420	517.4	±5.4	521	±15	1	11.96	1.1	0.05777	0.67	11.96	1.1	0.05777	0.67	0.6658	1.3	0.08358	1.1	.848
2.1	0.00	5186	34710	6.9	373	518.6	±5.3	523	±15	1	11.94	1.1	0.05782	0.69	11.94	1.1	0.05782	0.69	0.6678	1.3	0.08377	1.1	.839
2.2	0.01	14278	34858	2.5	1010	508.8	±5	512	±11	1	12.17	1	0.05762	0.47	12.18	1	0.05754	0.48	0.6516	1.1	0.08213	1	.905
3.1	0.00	8823	69455	8.1	638	521	±5.2	503	±13	-4	11.88	1	0.05729	0.58	11.88	1	0.05729	0.58	0.6649	1.2	0.08417	1	.875
4.1	0.00	6969	33650	5.0	502	519.3	±5.3	483	±23	-8	11.92	1.1	0.05679	1	11.92	1.1	0.05679	1	0.6568	1.5	0.08389	1.1	.716
5.1	0.37	11838	30853	2.7	863	523.3	±5.2	527	±20	1	11.78	1	0.0609	0.49	11.83	1	0.05793	0.91	0.6754	1.4	0.08456	1	.755
6.1	0.00	6582	34327	5.4	475	520.4	±5.3	522	±14	0	11.89	1.1	0.05778	0.63	11.89	1.1	0.05778	0.63	0.6698	1.2	0.08407	1.1	.862
6.2	--	13304	32089	2.5	948	513.7	±5.1	526	±24	2	12.06	1	0.05764	1.1	12.05	1	0.0579	1.1	0.6623	1.5	0.08296	1	.691
8.1	0.00	10827	31573	3.0	783	521.2	±5.3	512	±17	-2	11.87	1	0.05754	0.75	11.87	1	0.05754	0.75	0.6681	1.3	0.08422	1	.812
9.1	0.00	6040	30439	5.2	432	515	±5.3	517	±16	0	12.02	1.1	0.05767	0.73	12.02	1.1	0.05767	0.73	0.6613	1.3	0.08317	1.1	.827
9.2	0.00	20639	32061	1.6	1470	511.9	±5	513.6	± 9.2	0	12.1	1	0.05757	0.42	12.1	1	0.05757	0.42	0.6561	1.1	0.08264	1	.925
10.1	0.04	14002	44815	3.3	1050	541.4	±5.4	495	±16	-9	11.41	1	0.05743	0.66	11.41	1	0.05708	0.71	0.6896	1.3	0.08762	1	.825
10.2	0.00	13315	33244	2.6	945	511.5	±5.1	494	±27	-4	12.11	1	0.05706	1.2	12.11	1	0.05706	1.2	0.65	1.6	0.08258	1	.646
11.1	0.00	7932	31796	4.1	565	513.7	±5.8	518	±14	1	12.06	1.2	0.05769	0.65	12.06	1.2	0.05769	0.65	0.6598	1.3	0.08295	1.2	.875
12.1	--	11976	33133	2.9	850	511.7	±5.1	493	±15	-4	12.11	1	0.05679	0.63	12.1	1	0.05704	0.68	0.6498	1.2	0.08262	1	.838
13.1	--	6423	34205	5.5	461	517.9	±5.4	520	±22	0	11.96	1.1	0.05708	0.85	11.95	1.1	0.05774	0.98	0.666	1.5	0.08366	1.1	.738
14.1	--	13024	54318	4.3	958	529.5	±5.6	508	±13	-4	11.68	1.1	0.05726	0.55	11.68	1.1	0.05744	0.58	0.678	1.2	0.0856	1.1	.883
15.1	--	6122	34844	5.9	430	507.1	±5.3	522	±25	3	12.23	1.1	0.05734	1.1	12.22	1.1	0.0578	1.1	0.652	1.6	0.08183	1.1	.696
15.2	0.00	5037	35717	7.3	353	505.4	±5.4	509	±21	1	12.26	1.1	0.05744	0.94	12.26	1.1	0.05744	0.94	0.6459	1.5	0.08155	1.1	.763
16.1	0.00	12576	34037	2.8	883	506.3	±5.1	491	±14	-3	12.24	1.1	0.05698	0.64	12.24	1.1	0.05698	0.64	0.6418	1.2	0.0817	1.1	.855
16.2	0.00	6366	56220	9.1	455	515.5	±5.5	503	±21	-2	12.01	1.1	0.05731	0.95	12.01	1.1	0.05731	0.95	0.6578	1.5	0.08325	1.1	.760
16.3	--	6125	35495	6.0	438	515.5	±5.4	514	±22	0	12.02	1.1	0.05714	0.86	12.01	1.1	0.05758	10	0.6608	1.5	0.08324	1.1	.740

Errors are 1-sigma; Pb_c and Pb^* indicate the common and radiogenic portions, respectively.

Error in Standard calibration was 0.27% (not included in above errors but required when comparing data from different mounts).

(1) Common Pb corrected using measured ^{204}Pb.

Summary of SHRIMP U-Pb zircon data for sample LVR001

Grain.Spot	% $^{206}Pb_c$	ppm U	ppm Th	$^{232}Th/^{238}U$	ppm $^{206}Pb^*$	(1) $^{206}Pb/^{238}U$ Age		(1) $^{207}Pb/^{206}Pb$ Age		% Dis-cor-dant	Total $^{238}U/^{206}Pb$	±%	Total $^{207}Pb/^{206}Pb$	±%	(1) $^{238}U/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{235}U$	±%	(1) $^{206}Pb^*/^{238}U$	±%	err corr
1.1	2.31	7806	812	0.11	453	412.1	± 4.3	463	±82	12	14.8	1.1	0.075	2.5	15.15	1.1	0.0563	3.7	0.512	3.8	0.06602	1.1	.279
1.2	7.22	10862	1063	0.10	775	478.4	± 5.1	518	±49	8	12.04	1	0.1164	0.68	12.98	1.1	0.0577	2.2	0.613	2.5	0.07704	1.1	.446
2.1	2.91	5694	433	0.08	511	623.1	± 6.2	573	±61	-8	9.566	1	0.08289	0.4	9.85	1	0.0592	2.8	0.828	3	0.1015	1	.346
3.1	1.43	6998	679	0.10	520	527	± 5.3	502	±16	-5	11.57	1	0.06891	0.26	11.74	1	0.05727	0.73	0.6726	1.3	0.08519	1	.818
4.1	0.02	323	206	0.66	103	2036	±19	1988	±12	-2	2.692	1.1	0.12238	0.7	2.693	1.1	0.12219	0.7	6.257	1.3	0.3714	1.1	.840
7.1	1.56	6991	478	0.07	390	399.5	± 3.9	413	±20	3	15.4	1	0.06765	0.26	15.64	1	0.05503	0.9	0.4851	1.4	0.06393	1	.749
8.1	3.35	4984	1003	0.21	383	534.8	± 5.7	553	±49	3	11.17	1.1	0.0859	0.88	11.56	1.1	0.0586	2.3	0.699	2.5	0.08651	1.1	.440
5.1	--	41	34	0.85	4.88	838	±13	857	±91	2	7.24	1.7	0.0635	2.4	7.2	1.7	0.0676	4.4	1.295	4.7	0.1389	1.7	.363
6.1	0.81	5968	593	0.10	381	458	± 4.5	469	±16	2	13.47	1	0.063	0.36	13.58	1	0.05642	0.73	0.5729	1.2	0.07364	1	.811
17.1	0.00	343	170	0.51	109	2022	±19	1966.5	± 9	-3	2.714	1.1	0.1207	0.51	2.714	1.1	0.1207	0.51	6.131	1.2	0.3684	1.1	.907
18.1	0.02	476	215	0.47	142	1919	±18	1960.1	± 6	2	2.884	1.1	0.12039	0.33	2.885	1.1	0.12026	0.34	5.748	1.1	0.3467	1.1	.953
11.2	0.00	10060	653	0.07	750	536.6	± 5.2	444	±13	-17	11.52	1	0.05578	0.58	11.52	1	0.05578	0.58	0.6676	1.2	0.08681	1	.868
11.1	6.34	12560	842	0.07	1360	721.2	± 7.4	536	±46	-26	7.913	1	0.10981	0.37	8.448	1.1	0.0582	2.1	0.949	2.4	0.1184	1.1	.461
11.3	4.93	3684	264	0.07	285	528.9	± 5.4	509	±53	-4	11.12	1	0.09751	0.89	11.69	1.1	0.0575	2.4	0.677	2.6	0.08551	1.1	.403
10.2	1.59	3789	220	0.06	270	506.2	± 5	441	±34	-13	12.05	1	0.06857	0.91	12.24	1	0.05571	1.5	0.627	1.8	0.08169	1	.553
16.1	8.68	5188	307	0.06	332	424.1	± 4.7	407	±54	-4	13.43	1	0.12513	0.28	14.7	1.1	0.0549	2.4	0.515	2.7	0.06801	1.1	.430
16.2	3.62	9398	437	0.05	399	299.6	± 3	307	±33	3	20.26	1	0.08163	0.26	21.02	1	0.0525	1.5	0.3444	1.8	0.04757	1	.577

Errors are 1-sigma; Pb_c and Pb^* indicate the common and radiogenic portions, respectively.

Error in Standard calibration was 0.58% (not included in above errors but required when comparing data from different mounts).

(1) Common Pb corrected using measured ^{204}Pb.

Summary of SHRIMP U-Pb data for monazites from sample LRV001

Grain.Spot	% $^{206}Pb_c$	ppm U	ppm Th	$^{232}Th/^{238}U$	ppm $^{206}Pb^*$	(1) $^{206}Pb/^{238}U$ Age		(1) $^{207}Pb/^{206}Pb$ Age		% Dis-cor-dant	Total $^{238}U/^{206}Pb$	±%	Total $^{207}Pb/^{206}Pb$	±%	(1) $^{238}U/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{235}U$	±%	(1) $^{206}Pb^*/^{238}U$	±%	err corr
7.1	--	2127	87532	42.5	149	506.9	±6.9	528	±33	4	12.24	1.4	0.0572	1.4	12.22	1.4	0.05796	1.5	0.654	2.1	0.0818	1.4	.685
9.1	--	1162	54116	48.1	86.1	534.6	±8.1	539	±46	1	11.6	1.6	0.056	2.2	11.56	1.6	0.0582	2.1	0.694	2.6	0.0865	1.6	.602
9.2	--	2297	91667	41.2	166	522.4	±9	479	±30	-9	11.87	1.8	0.05531	1.4	11.85	1.8	0.05669	1.4	0.66	2.3	0.0844	1.8	.792

Errors are 1-sigma; Pb_c and Pb^* indicate the common and radiogenic portions, respectively.
Error in Standard calibration was 0.60% (not included in above errors but required when comparing data from different mounts).
(1) Common Pb corrected using measured ^{204}Pb.

Summary of SHRIMP U-Pb zircon data for sample LVA-1

Grain.Spot	% $^{206}Pb_c$	ppm U	ppm Th	$^{232}Th/^{238}U$	ppm $^{206}Pb^*$	(1) $^{206}Pb/^{238}U$ Age		(1) $^{207}Pb/^{206}Pb$ Age		% Dis-cor-dant	(1) $^{207}Pb^*/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{235}U$	±%	(1) $^{206}Pb^*/^{238}U$	±%	err corr
1.1	0.42	5213	118	0.02	235	328.7	± 3.3	438	± 14	33	0.05565	0.62	0.4014	1.2	0.05231	1	.859
2.1	1.20	8981	1691	0.19	6900	4080	±31	547	± 26	-87	0.05845	1.2	7.12	1.6	0.8832	1	.651
3.1	1.10	7601	847	0.12	2610	2147	±19	576	± 22	-73	0.05924	0.99	3.228	1.4	0.3952	1	.719
4.1	0.08	678	445	0.68	158	1545	±15	1808.5	± 5.3	17	0.11055	0.29	4.127	1.1	0.2708	1.1	.966
5.1	0.02	71	61	0.90	20.4	1868	±23	1859	± 13	0	0.1137	0.73	5.271	1.6	0.3362	1.4	.886
6.1	0.59	7291	154	0.02	218	219.4	± 2.3	346	± 18	58	0.0534	0.8	0.255	1.3	0.03463	1.1	.796
7.1	--	255	145	0.59	37	1007	±11	1074	± 16	7	0.07519	0.77	1.753	1.4	0.1691	1.2	.837
8.1	0.28	10407	320	0.03	692	479.5	± 4.8	506.8	± 7.7	6	0.0574	0.35	0.6111	1.1	0.07721	1	.947
9.1	1.02	4360	44	0.01	755	1173	±11	536	± 22	-54	0.05817	0.98	1.601	1.4	0.1996	1	.722
10.1	1.45	7137	196	0.03	1100	1046.7	± 9.8	573	± 28	-45	0.05916	1.3	1.438	1.6	0.1763	1	.617
11.1	0.47	3367	80	0.02	195	418.5	± 4.4	513	± 17	23	0.05757	0.75	0.5324	1.3	0.06708	1.1	.825
12.1	0.46	9588	356	0.04	1000	736.7	± 7.2	532	± 14	-28	0.05806	0.62	0.969	1.2	0.1211	1	.855
13.1	1.49	8219	287	0.04	558	482.9	± 4.8	529	± 30	10	0.05798	1.4	0.622	1.7	0.07779	1	.598
14.1	7.30	8434	245	0.03	1000	778.1	± 8.3	632	±150	-19	0.0608	7	1.075	7.1	0.1283	1.1	.159
15.1	0.10	7481	195	0.03	496	478.5	± 4.7	503.6	± 6.2	5	0.05731	0.28	0.6089	1.1	0.07706	1	.963
15.2	0.06	7044	167	0.02	371	383.2	± 3.8	477.4	± 6.9	25	0.05664	0.31	0.4783	1.1	0.06125	1	.956
16.1	0.37	5852	58	0.01	209	261.2	± 2.6	424	± 15	62	0.05529	0.67	0.3153	1.2	0.04136	1	.835
17.1	0.81	9709	262	0.03	822	600.9	± 5.8	526	± 17	-12	0.05791	0.78	0.7801	1.3	0.0977	1	.793
18.1	0.88	9418	207	0.02	1200	886.7	± 8.4	514	± 18	-42	0.0576	0.82	1.171	1.3	0.1475	1	.778

Errors are 1-sigma; Pb_c and Pb^* indicate the common and radiogenic portions, respectively.
Error in Standard calibration was 0.19% (not included in above errors but required when comparing data from different mounts).
(1) Common Pb corrected using measured ^{204}Pb.

Summary of SHRIMP U-Pb zircon data for sample LCZF-2

Grain.Spot	% $^{206}Pb_c$	ppm U	ppm Th	$^{232}Th/^{238}U$	ppm $^{206}Pb^*$	(3) $^{206}Pb/^{238}U$ Age		(3) $^{207}Pb/^{206}Pb$ Age		% Dis-cor-dant	(1) $^{207}Pb^*/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{235}U$	±%	(1) $^{206}Pb^*/^{238}U$	±%	err corr
1.1	1.47	2219	127	0.06	141	449.5	± 4.7	531	± 100	17	0.0631	4.7	0.632	4.8	0.07267	1.1	.220
2.1	22.84	2685	46	0.02	184	362.2	± 8	-490	±1200	-228	0.093	18	0.79	19	0.0615	2.2	.117
3.1	1.07	3465	103	0.03	249	511.2	± 5.5	520	± 21	2	0.05862	1.2	0.668	1.6	0.08262	1.1	.678
4.1	6.61	4029	104	0.03	240	400.8	± 4.6	427	± 140	6	0.064	5.8	0.572	5.9	0.06482	1.1	.190
5.1	2.90	3931	122	0.03	241	428.5	± 4.5	480	± 67	11	0.0635	2.6	0.607	2.8	0.0693	1	.367
6.1	--	1989	67	0.03	147	530.7	± 5.4	518.3	± 8	-2	0.05788	0.33	0.685	1.1	0.08583	1	.954
7.1	0.88	7482	323	0.04	263	256.1	± 2.6	322	± 30	26	0.05401	1.2	0.3022	1.5	0.04058	1	.656
8.1	5.07	4558	158	0.04	293	439.6	± 7.1	621	± 470	41	0.0651	15	0.637	15	0.07096	1.3	.083
9.1	2.49	3629	87	0.02	227	440.3	± 4.5	490	± 76	11	0.0589	3.7	0.575	3.9	0.07085	1	.268
10.1	12.46	5894	155	0.03	294	302.8	± 5	-29	± 600	-109	0.096	11	0.671	11	0.05089	1.5	.138
11.1	0.21	3649	105	0.03	276	542.5	± 5.3	515.7	± 7.8	-5	0.05824	0.4	0.7055	1.1	0.08786	1	.930
12.1	10.04	2352	30	0.01	166	454.3	± 5.8	425	± 240	-8	0.0671	9.2	0.685	9.2	0.07406	1.2	.133
13.1	8.78	4641	119	0.03	258	359	± 4.5	186	± 260	-50	0.0742	7.4	0.603	7.5	0.05893	1.2	.157
14.1	0.04	853	120	0.15	61.3	517.6	± 5.3	494	± 17	-5	0.05712	0.66	0.6585	1.2	0.08361	1	.841
15.1	1.22	5887	227	0.04	363	439.9	± 4.4	459	± 29	4	0.05873	1.3	0.5737	1.7	0.07085	1	.602
16.1	2.27	3432	86	0.03	231	474.3	± 5	506	± 53	6	0.059	2.5	0.622	2.8	0.0765	1.1	.386
17.1	2.94	3189	127	0.04	242	521.2	± 5.5	499	± 96	-6	0.0709	2.7	0.836	2.9	0.08559	1	.358
18.1	11.01	3028	77	0.03	205	429.6	± 5.8	397	± 270	-9	0.0708	9.1	0.686	9.2	0.07026	1.3	.136
19.1	1.19	5839	275	0.05	388	473.5	± 5.3	449	± 27	-5	0.05775	1.2	0.6082	1.6	0.07639	1.1	.686
20.1	3.38	3399	77	0.02	223	456.9	± 5.2	495	± 110	8	0.0605	4.8	0.615	4.9	0.07376	1.1	.229
21.1	0.32	1199	94	0.08	246	1376	±13	1784	± 15	29	0.1105	0.56	3.632	1.2	0.2384	1	.880

Errors are 1-sigma; Pb_c and Pb^* indicate the common and radiogenic portions, respectively.

Error in Standard calibration was 0.31% (not included in above errors but required when comparing data from different mounts).

(1) Common Pb corrected using measured ^{204}Pb.

Summary of SHRIMP U-Pb zircon data for sample CZRL-1

Grain.Spot	% $^{206}Pb_c$	ppm U	ppm Th	$^{232}Th/^{238}U$	ppm $^{206}Pb^*$	(1) $^{206}Pb/^{238}U$ Age		(1) $^{207}Pb/^{206}Pb$ Age		% Dis-cor-dant	(1) $^{207}Pb^*/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{235}U$	±%	(1) $^{206}Pb^*/^{238}U$	±%	err corr
1.1	0.10	299	221	0.76	77.5	1698	±16	1850.6	± 9.2	8	0.11315	0.51	4.702	1.2	0.3014	1.1	.906
2.1	8.18	3050	607	0.21	149	329	± 3.7	560	±170	41	0.0588	7.8	0.425	7.9	0.05236	1.2	.147
3.1	8.28	3367	370	0.11	181	359	± 4	488	±180	26	0.0569	8	0.449	8.1	0.05727	1.2	.143
4.1	0.14	123	68	0.57	21.7	1200	±13	1183	± 20	-1	0.07942	1	2.241	1.6	0.2046	1.2	.756
5.1	0.36	81	55	0.70	13.7	1156	±16	1185	± 32	2	0.0795	1.6	2.154	2.2	0.1965	1.5	.684
5.2	13.63	4129	165	0.04	182	278.8	± 3.7	402	±310	31	0.0548	14	0.334	14	0.0442	1.4	.097
6.1	0.08	184	85	0.48	57.8	2008	±22	2036	± 10	1	0.12551	0.56	6.325	1.4	0.3655	1.2	.912
7.1	0.18	2007	105	0.05	138	495.3	± 4.9	510	± 12	3	0.05748	0.54	0.633	1.2	0.07986	1	.884
8.1	0.27	1902	114	0.06	133	504.7	± 5	504	± 19	0	0.05732	0.85	0.6435	1.3	0.08143	1	.772
9.1	0.00	124	279	2.32	37.7	1948	±19	1870	± 12	-4	0.11436	0.67	5.564	1.3	0.3529	1.1	.862
10.1	0.58	2345	200	0.09	155	473.7	± 4.7	520	± 19	9	0.05774	0.86	0.607	1.3	0.07625	1	.767
11.1	13.98	4480	966	0.22	188	265.7	± 3.6	490	±310	46	0.057	14	0.33	14	0.04208	1.4	.098
12.1	7.91	2621	184	0.07	126	324.6	± 3.7	483	±170	33	0.0568	7.8	0.404	7.9	0.05165	1.2	.146
13.1	2.02	90	106	1.21	10.2	782	±10	777	±110	-1	0.0651	5.2	1.158	5.4	0.129	1.4	.254
14.1	13.01	3567	695	0.20	160	285.6	± 3.8	343	±310	17	0.0533	14	0.333	14	0.0453	1.3	.098
15.1	2.68	2426	762	0.32	142	413.5	± 4.2	514	± 63	20	0.0576	2.9	0.526	3.1	0.06625	1.1	.345
16.1	0.01	224	114	0.53	92.6	2530	±28	2678	± 7.1	6	0.18275	0.43	12.11	1.4	0.4807	1.3	.952
17.1	6.16	3398	528	0.16	156	315	± 3.4	544	±130	42	0.0584	5.9	0.403	6	0.05008	1.1	.184
18.1	0.48	1921	111	0.06	134	500.7	± 5	511	± 21	2	0.0575	0.96	0.6403	1.4	0.08076	1	.734

Errors are 1-sigma; Pb_c and Pb^* indicate the common and radiogenic portions, respectively.

Error in Standard calibration was 0.51% (not included in above errors but required when comparing data from different mounts).

(1) Common Pb corrected using measured ^{204}Pb.

Summary of SHRIMP U-Pb zircon data for sample CZRL-3

Grain.Spot	% $^{206}Pb_c$	ppm U	ppm Th	$^{232}Th/^{238}U$	ppm $^{206}Pb^*$	(1) $^{206}Pb/^{238}U$ Age		(1) $^{207}Pb/^{206}Pb$ Age		% Dis-cor-dant	(1) $^{207}Pb^*/^{206}Pb^*$	±%	(1) $^{207}Pb^*/^{235}U$	±%	(1) $^{206}Pb^*/^{238}U$	±%	err corr
2.1	0.11	2815	144	0.05	197	503	± 5.1	515	± 13	2	0.0576	0.58	0.6445	1.2	0.08115	1.1	.876
3.1	1.42	259	170	0.68	78.1	1916	±19	1986	± 21	4	0.122	1.2	5.823	1.7	0.3461	1.2	.697
4.1	0.47	143	54	0.39	43.5	1948	±22	2030	± 18	4	0.1251	1	6.09	1.7	0.3529	1.3	.797
5.1	0.10	2913	150	0.05	206	508.3	± 5.2	522	± 20	3	0.0578	0.92	0.6539	1.4	0.08204	1.1	.759
8.1	0.02	145	129	0.92	47.4	2084	±20	2119.5	± 6.7	2	0.13161	0.38	6.924	1.2	0.3816	1.1	.944
9.1	0.19	2444	104	0.04	173	510.6	± 5	507.7	± 9.7	-1	0.05742	0.44	0.6525	1.1	0.08242	1	.916
10.1	0.02	2186	98	0.05	159	524.8	± 5.1	597	± 15	12	0.05983	0.7	0.6997	1.2	0.08482	1	.820
11.1	0.47	2374	110	0.05	164	497.7	± 4.8	509	± 19	2	0.05745	0.84	0.6357	1.3	0.08026	1	.768
11.2	0.30	684	275	0.42	152	1477	±13	2030	± 11	27	0.1251	0.59	4.442	1.2	0.2575	1	.865
12.1	0.65	4244	239	0.06	304	512.8	± 5	568	± 19	10	0.05902	0.89	0.6737	1.4	0.08279	1	.751
13.1	1.25	2848	142	0.05	201	503.5	± 5	536	±100	6	0.0582	4.7	0.651	4.8	0.08123	1	.217
14.1	0.53	2365	99	0.04	167	507.5	± 4.9	513	± 16	1	0.05756	0.71	0.6501	1.2	0.08191	1	.818
15.1	0.47	2793	122	0.05	194	499.1	± 4.9	504	± 35	1	0.05733	1.6	0.636	1.9	0.0805	1	.535
16.1	3.78	3762	209	0.06	284	523.7	± 5.3	723	±100	28	0.0634	4.7	0.74	4.8	0.08463	1.1	.218
17.1	0.01	2831	124	0.05	204	518.8	± 5.1	505	± 6.4	-3	0.05735	0.29	0.6627	1.1	0.08381	1	.962
18.1	0.04	3925	225	0.06	335	610.1	± 5.9	836.5	± 6.1	27	0.06696	0.29	0.9164	1	0.09926	1	.960
19.1	0.01	400	318	0.82	128	2034	±18	2045.5	± 4.5	1	0.12619	0.25	6.455	1.1	0.371	1	.972

Errors are 1-sigma; Pb_c and Pb^* indicate the common and radiogenic portions, respectively.
Error in Standard calibration was 0.27% (not included in above errors but required when comparing data from different mounts).
(1) Common Pb corrected using measured ^{204}Pb.

Appendix 2B: Lu-Hf Isotopic Data

Sample	Grain	Spot	$^{176}Hf/^{177}Hf$	± 2 se	$^{176}Lu/^{177}Hf$	± 2 se	U-Pb Age (T1)	e Hf(0)	$176/177_{T1}$	e Hf(t1)	$^{176}Hf/^{177}Hf$ DM (T1)	T DM (2)
LHA010	1	1	0.282117	0.000043	0.001111	0.000034	517.4	-23.17	0.282106	-12.17	0.282851	2189
LHA010	2	2	0.282136	0.000031	0.001785	0.000111	438.9	-22.49	0.282121	-13.36	0.282908	2203
LHA010	2	1	0.282137	0.000030	0.001704	0.000097	529.7	-22.46	0.282120	-11.41	0.282842	2151
LHA010	3	1	0.282145	0.000036	0.001922	0.000043	529.2	-22.18	0.282126	-11.21	0.282843	2139
LHA010	4	1	0.282154	0.000031	0.001671	0.000066	525.1	-21.85	0.282138	-10.87	0.282846	2115
LHA010	10	1	0.282140	0.000028	0.000955	0.000066	532.1	-22.36	0.282130	-10.99	0.282841	2127
LHA010	11	1	0.282166	0.000033	0.001797	0.000102	531.8	-21.44	0.282148	-10.37	0.282841	2089
LHA010	12	2	0.282109	0.000034	0.001519	0.000071	382.9	-23.45	0.282098	-15.43	0.282949	2288
LHA010	14	2	0.282125	0.000028	0.001516	0.000016	501.2	-22.87	0.282111	-12.35	0.282863	2188
LHA010	17	2	0.282097	0.000028	0.001631	0.000043	524.4	-23.86	0.282081	-12.89	0.282846	2240
LHA010	18	1	0.281446	0.000036	0.000747	0.000028	2014.0	-46.88	0.281418	-2.92	0.281749	2764
LHA010	19	1	0.282100	0.000033	0.001441	0.000059	515.8	-23.77	0.282086	-12.92	0.282852	2235
LHA010	20	1	0.282101	0.000028	0.001058	0.000067	518.4	-23.73	0.282091	-12.69	0.282850	2223
LHA010	20	2	0.282105	0.000033	0.001425	0.000038	400.5	-23.60	0.282094	-15.18	0.282936	2286
LHA010	21	1	0.282112	0.000027	0.001230	0.000020	517.7	-23.35	0.282100	-12.38	0.282851	2203
LID045	2	1	0.281395	0.000029	0.001231	0.000043	2041.4	-48.68	0.281348	-4.78	0.281729	2904
LID045	3	1	0.281357	0.000030	0.000938	0.000041	2045.6	-50.05	0.281320	-5.66	0.281726	2962
LID045	3	2	0.281368	0.000028	0.000910	0.000053	1978.9	-49.64	0.281334	-6.69	0.281776	2976
LID045	4	1	0.281580	0.000041	0.000800	0.000044	1999.8	-42.15	0.281550	1.44	0.281760	2477
LID045	5	1	0.281376	0.000032	0.001350	0.000042	2012.0	-49.37	0.281324	-6.29	0.281751	2976
LID045	6	1	0.281326	0.000026	0.001566	0.000078	1987.4	-51.15	0.281267	-8.90	0.281769	3121
LID045	7	1	0.281298	0.000027	0.001427	0.000045	2047.0	-52.13	0.281242	-8.40	0.281725	3135
LID045	7	2	0.281392	0.000023	0.001669	0.000028	2026.0	-48.79	0.281328	-5.83	0.281740	2958
LID045	12	1	0.281424	0.000032	0.000726	0.000026	2004.0	-47.66	0.281397	-3.90	0.281757	2819
LID045	13	1	0.281334	0.000022	0.000912	0.000017	2004.0	-50.86	0.281299	-7.36	0.281757	3037
LID045	14	1	0.281345	0.000023	0.001135	0.000032	2017.7	-50.45	0.281302	-6.95	0.281747	3022
LID045	16	1	0.281356	0.000027	0.001280	0.000061	2081.0	-50.09	0.281305	-5.39	0.281699	2972
LID045	17	1	0.281383	0.000028	0.000586	0.000003	2022.0	-49.12	0.281360	-4.77	0.281743	2888
LID045	18	2	0.281354	0.000026	0.000435	0.000005	2056.0	-50.16	0.281337	-4.84	0.281718	2918

Appendix 2C: Oxygen Isotopic Data

Table 11: Summary of SHRIMP oxygen isotope data for zircons from samples LHA010 and LID045

Sample	Grain. spot	18O/ 16O ratio	ratio ‰
LHA010	1.1	0.002194	7.18
LHA010	10.1	0.002193	6.79
LHA010	11.1	0.002191	5.80
LHA010	11.2	0.002193	6.76
LHA010	12.2	0.002185	3.37
LHA010	14.2	0.002192	6.29
LHA010	17.1	0.002194	7.25
LHA010	18.1	0.00219	5.41
LHA010	19.1	0.002193	6.97
LHA010	2.1	0.002193	7.07
LHA010	2.2	0.00219	5.38
LHA010	20.1	0.002192	6.61
LHA010	20.2	0.002189	5.14
LHA010	21.1	0.002193	7.09
LHA010	3.1	0.002194	7.47
LHA010	4.1	0.002194	7.22
LID045	12.1	0.002191	5.72
LID045	13.1	0.002198	8.82
LID045	14.1	0.002196	7.99
LID045	16.1	0.002199	9.50
LID045	17.1	0.002194	7.10
LID045	18.2	0.002193	6.42
LID045	2.1	0.00219	5.37
LID045	3.1	0.002191	5.85
LID045	3.2	0.00219	5.03
LID045	4.1	0.002192	6.26
LID045	5.1	0.002198	8.93
LID045	6.1	0.002194	6.97
LID045	7.1	0.002195	7.23
LID045	7.2	0.002198	8.62

Ratios are reported relative to the value 8.2 for the Temora zircon standard
Uncertainty on individual ratios is 0.25 permil, the standard deviation obtained for the Temora standard during the session,

Appendix 2D – Procedure for Geochronology

U-Pb geochronology was conducted on zircon, monazite and titanite crystals from a variety of rocks in the study area. The samples were analysed using the Sensitive High Resolution Ion Microprobe (SHRIMP II) at the Research School of Earth Sciences (RSES) at the Australian National University (ANU). A brief overview of the principles of geochronology by ion microprobe is provided.

Principles of U-Pb geochronology

The technique of U-Pb geochronology utilizes the principle of radioactive decay of isotopes of certain elements. The nuclei of these radioactive isotopes are unstable, and will spontaneously decay to form stable isotopes of different elements. This process happens at a specific constant rate for each isotope, regardless of variations in pressure, temperature, chemical state, etc. and can be described by the equation:

$$D=P(e^{\lambda t}-1) \qquad (1)$$

Where D is the number of daughter atoms created, P is the number of parent atoms, λ is the decay constant specific for each radioactive isotope, and t is the period of time. Since the number of daughter and parent atoms can be measured, and the decay constant is known, one can calculate the amount of time which has elapsed since decay began (assuming no daughter atoms were present initially, and no parent or daughter atoms have been lost from the system since decay began). The U-Pb technique is based on the decay of isotopes of Uranium and Thorium, to form Lead. ^{235}U decays to form ^{207}Pb ($\lambda = 9.8485 \times 10^{-10}$), ^{238}U decays to form ^{206}Pb ($\lambda = 1.55125 \times 10^{-10}$), and ^{232}Th decays to ^{208}Pb ($\lambda = 4.9475 \times 10^{-11}$). Since two isotopes of uranium decay to two isotopes of lead, the system is ideal for dating material which contains large amounts of uranium, but which lacks any initial lead. The mineral zircon is ideal, as it may accommodate some uranium in its structure, but excludes lead. Monazite and titanite are also suitable for this isotope system. Additionally, because U-Pb uses a paired isotope system, open system behavior is much less of a problem than with other techniques.

SHRIMP II Systematics

The SHRIMP II is an ion microprobe, which produces a narrow ion beam ideal for analyzing the complex minerals with numerous growth episodes which as may be expected from a polydeformational, polymetamorphic orogenic belt such as the Central Zone. The technique uses a fine primary oxygen ion beam (20μm diameter) focused on the sample, to eject particles from the surface of the sample (known as sputtering). A fraction of these ejected particles are ionized and electrostatically removed from the sample. These secondary ions from the sample pass through the electrostatic analyser and magnet, and are separated according to charges and masses (Fig. 1).

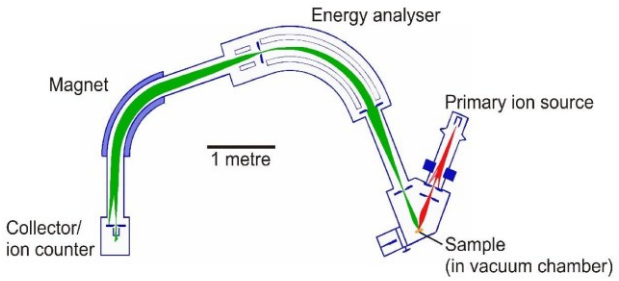


Fig. 1 – Schematic setup of the SHRIMP II instrument at RSES, Canberra (after Williams, 1998)

Sample Preparation

Samples were prepared at the University of the Witwatersrand; initially samples were crushed and sieved to form +90um -250 μm size fraction. The samples were then processed on a Wilfley table, and the heavy mineral fraction was collected. Samples containing abundant biotite or amphibole were then passed through a franz magnetic separator with a low current to remove these minerals. The heavy mineral fractions were then further concentrated using heavy liquids (Bromoform and Iodine-methane), and this concentrate was passed repeatedly through a franz magnetic separator using a progressively higher current to remove the magnetic fraction, leading to a pure non-magnetic zircon concentrate. In order to obtain monazite, the magnetic fraction was passed through the franz magnetic separator using a current of 0.8 mA, to concentrate the monazite. Monazite was then separated by hand under a binocular microscope, as was titanite. Zircon, monazite and titanite for analysis was then handpicked under a binocular microscope at the RSES, ANU, and the grains were mounted in epoxy together with the SHRIMP zircon standards TEMORA, the SHRIMP monazite standard 44069, and the SHRIMP titanite standard BLR-1. Grain mounts were then sectioned, polished, photographed in transmitted and reflected light, and imaged under cathodolumincesce (for zircon) or backscattered electon imaging (for monazite) on a scanning electron microscope to identify any cores, zonation or metamorphic overgrowths, and to select spots for analysis, avoiding cracks and inclusions.

Standards and Corrections

The SHRIMP data were reduced following Williams (1998), Williams and Claesson (1987), and Compston et al. (1992) and using the SQUID Excel Macro of Ludwig (2000). The U and Th concentrations were determined relative to those measured in the Temora standard. Ages were calculated using the radiogenic $^{207}Pb/^{206}Pb$ ratios, with the correction for common Pb made using the measured ^{204}Pb and the appropriate common Pb composition, assuming the model of Cumming and Richards (1975). Uncertainties in the individual isotopic ratios and ages are reported at the 1*r* level, unless otherwise stated in the text, and the final weighted mean ages are reported as 95% confidence limits. The concordia plots and weighted mean age calculations were carried out using Isoplot 3.00 (Ludwig, 2003).

Appendix 2E – Procedure for Oxygen and Hafnium Isotopic Analyses

Two samples, LHA010 and LID045, were selected for O-isotope and Hf-isotope analyses.

O-isotopes

O-isotope analyses were carried out on the same spots, or as close as possible to those spots used for U-Pb analyses. Following U-Pb analysis, the analyzed grains were polished again to remove the ~2µm deep sputtering pits and implanted oxygen from the U-Pb analysis. Spots were analysed using the SHRIMP II at RSES, which is fitted with a IGS-4 alkali metal ion gun fitted with a Cs+ firing unit, producing a Cs+ primary ion source, with a spot size of ~25um, and generating ~250pA of O- secondary ions (Ickert et al., 2008). A Kimball Physics ELG-5 electron gun is also fitted in the source chamber, to generate an electron beam, typically delivering ~1uA to the sample surface to neutralise charge buildup from the Cs+ ion source. A redesigned, larger (35 mm diameter) sample mount was used (standard SHRIMP sample mounts are 25mm diameter) to eliminate any isotopic gradient over the central portion of the mount, a problem with standard mounts, which may result in mass fractionation over this area. The procedures used and corrections applied are those described by Ickert *et al.* (2008). Oxygen isotope analyses were normalized to the TEMORA 2 standard ($\delta^{18}O$ = 8.2; Black et al., 2004).

Hf-isotopes

Hf-isotope measurements were conducted by laser ablation multicollector inductively coupled plasma mass spectroscopy using the RSES Neptune MC-ICPMS coupled with a 193 µnm ArF Excimer laser. Samples were photographed under a reflected light microscope subsequent to U-Pb and dating and O-isotope analysis by SHRIMP, to reveal the location on each grain of the ion probe sputter pit (typically about 25-30 µm across). Laser ablation analyses were performed on the same locations. For all analyses of unknowns or secondary standards, the laser spot size on the sample was 47 µm in diameter. The mass spectrometer was first tuned to optimal sensitivity using a large grain of zircon from the Monastery kimberlite.

The detector array was as follows:

Cup	L4	L3	L2	L1	C	H1	H2	H3	H4
Mass	171	173	174	175	176	177	178	179	181
Amplifier	6	5	1	7	2	8	3	9	4

All listed masses were measured simultaneously in static-collection mode. A gas blank was acquired at regular intervals throughout the analytical session (every ≈10 analyses).

The laser was fired with typically 5-8 Hz repetition rate and 60 mJ energy. Data was acquired for 100 seconds, but in many cases only a selected interval from the total acquisition was used in data reduction. In each batch of samples between gas blank measurements, several secondary standard zircons (91500, FC-1, Temora-2, Monastery and Mud Tank) were measured as a check on data quality, along with several unknowns.

Signal intensity was typically ≈5-6 V for total Hf at the beginning of ablation, and decreased over the acquisition time to 2 V or less. Isobaric interferences of ^{176}Lu and ^{176}Yb on the ^{176}Hf signal were corrected by monitoring signal intensities of ^{175}Lu and ^{173}Yb, ^{172}Yb and ^{171}Yb. The calculation of signal intensity for ^{176}Hf also involved independent mass bias corrections for Lu and Yb.