

Appendix 1

Grain No.	Isotopic ratios		Age (Ma)		Age (Ma)		Age (Ma)		Th/U
	<sup>206</sup> Pb/ <sup>238</sup> U	Error 1σ	<sup>207</sup> Pb/ <sup>235</sup> U	Error 1σ	<sup>206</sup> Pb/ <sup>238</sup> U	Error 1σ	<sup>207</sup> Pb/ <sup>235</sup> U	Error 1σ	
Chi-01 (GPS: 35° 28' 34.2" N, 138° 02' 59.52" E)									
Chi-01-001	0.3570 ± 0.0054		5.4700 ± 0.1177		1967.9 ± 29.9		1895.8 ± 40.8		0.37
Chi-01-002	0.3433 ± 0.0052		5.4584 ± 0.1112		1902.5 ± 28.6		1894.0 ± 38.6		0.17
Chi-01-003	0.3486 ± 0.0053		5.5709 ± 0.1232		1928.0 ± 29.5		1911.5 ± 42.3		0.21
Chi-01-004	0.3401 ± 0.0051		5.5547 ± 0.1154		1886.9 ± 28.5		1909.0 ± 39.7		0.28
Chi-01-005	0.0421 ± 0.0008		0.3416 ± 0.0204		265.8 ± 5.2		298.3 ± 17.9		0.65
Chi-01-006	0.0418 ± 0.0009		0.3668 ± 0.0256		264.2 ± 5.7		317.3 ± 22.2		0.58
Chi-01-007	0.0427 ± 0.0007		0.2957 ± 0.0131		269.7 ± 4.6		263.0 ± 11.7		0.71
Chi-01-008	0.0393 ± 0.0005		0.2930 ± 0.0092		248.3 ± 2.9		260.9 ± 8.2		0.13
Chi-01-009	0.0404 ± 0.0006		0.2624 ± 0.0124		255.2 ± 3.5		236.6 ± 11.2		0.81
Chi-01-010	0.3184 ± 0.0033		5.1535 ± 0.0803		1781.8 ± 18.6		1844.9 ± 28.7		0.33
Chi-01-011	0.3460 ± 0.0037		5.6090 ± 0.0954		1915.6 ± 20.5		1917.4 ± 32.6		0.31
Chi-01-012	0.3334 ± 0.0034		5.3826 ± 0.0808		1854.8 ± 19.2		1882.0 ± 28.2		0.12
Chi-01-013	0.3294 ± 0.0036		5.2815 ± 0.0932		1835.6 ± 19.8		1865.8 ± 32.9		0.47
Chi-01-014	0.0361 ± 0.0005		0.2385 ± 0.0076		228.4 ± 2.9		217.1 ± 6.9		0.49
Chi-01-015	0.3336 ± 0.0040		5.2904 ± 0.1066		1855.6 ± 22.5		1867.3 ± 37.6		0.42
Chi-01-016	0.0414 ± 0.0006		0.3053 ± 0.0147		261.3 ± 4.0		270.6 ± 13.0		0.50
Chi-01-017	0.0402 ± 0.0006		0.2781 ± 0.0139		254.2 ± 3.9		249.2 ± 12.4		0.56
Chi-01-018	0.0316 ± 0.0006		0.2138 ± 0.0149		200.3 ± 3.7		196.7 ± 13.7		0.35
Chi-01-019	0.3498 ± 0.0041		5.5743 ± 0.1024		1933.7 ± 22.9		1912.1 ± 35.1		0.16
Chi-01-020	0.3440 ± 0.0042		5.4516 ± 0.1098		1905.9 ± 23.1		1892.9 ± 38.1		0.16
Chi-01-021	0.3312 ± 0.0039		5.3851 ± 0.0942		1844.4 ± 21.6		1882.4 ± 32.9		0.26
Chi-01-022	0.0427 ± 0.0007		0.3094 ± 0.0219		269.8 ± 4.7		273.7 ± 19.4		0.89
Chi-01-023	0.0281 ± 0.0004		0.2013 ± 0.0126		178.8 ± 2.9		186.2 ± 11.7		0.92
Chi-01-024	0.3325 ± 0.0038		5.0705 ± 0.1329		1850.5 ± 21.3		1831.1 ± 48.0		1.04
Chi-01-025	0.3144 ± 0.0031		4.9892 ± 0.0859		1762.1 ± 17.3		1817.4 ± 31.3		0.17
Chi-01-026	0.3340 ± 0.0032		5.1287 ± 0.0859		1857.6 ± 18.0		1840.8 ± 30.8		0.30
Chi-01-027	0.3482 ± 0.0039		5.4206 ± 0.1303		1926.1 ± 21.4		1888.1 ± 45.4		0.90
Chi-01-028	0.3946 ± 0.0040		8.4900 ± 0.1580		2144.0 ± 21.9		2284.8 ± 42.5		0.47
Chi-01-029	0.3357 ± 0.0025		5.3451 ± 0.0774		1865.9 ± 13.9		1876.0 ± 27.2		0.30
Chi-01-030	0.0389 ± 0.0005		0.3059 ± 0.0170		246.1 ± 3.5		271.0 ± 15.0		0.31
Chi-01-031	0.3331 ± 0.0024		5.2548 ± 0.0720		1853.5 ± 13.6		1861.5 ± 25.5		0.22
Chi-01-032	0.3329 ± 0.0027		5.1532 ± 0.0943		1852.6 ± 15.2		1844.9 ± 33.8		0.70
Chi-01-033	0.0277 ± 0.0003		0.1987 ± 0.0078		175.9 ± 1.9		184.0 ± 7.2		0.47
Chi-01-034	0.0396 ± 0.0004		0.2889 ± 0.0125		250.6 ± 2.8		257.7 ± 11.1		1.14
Chi-01-035	0.0747 ± 0.0008		0.5484 ± 0.0230		464.4 ± 5.2		443.9 ± 18.6		0.47
Chi-01-036	0.0385 ± 0.0007		0.2970 ± 0.0189		243.4 ± 4.2		264.1 ± 16.8		0.44
Chi-01-037	0.0306 ± 0.0005		0.2055 ± 0.0120		194.3 ± 3.0		189.7 ± 11.0		0.48
Chi-01-038	0.3615 ± 0.0038		5.7306 ± 0.0932		1989.1 ± 20.9		1935.9 ± 31.5		0.16
Chi-01-039	0.0423 ± 0.0006		0.3095 ± 0.0142		267.3 ± 3.7		273.8 ± 12.6		0.33
Chi-01-040	0.0402 ± 0.0005		0.2799 ± 0.0113		253.8 ± 3.3		250.6 ± 10.1		0.88
Chi-01-041	0.3696 ± 0.0040		7.0879 ± 0.1314		2027.7 ± 22.2		2122.4 ± 39.3		0.12
Chi-01-042	0.0402 ± 0.0005		0.3015 ± 0.0092		253.8 ± 3.0		267.5 ± 8.2		0.57
Chi-01-043	0.0417 ± 0.0006		0.2843 ± 0.0105		263.7 ± 3.5		254.0 ± 9.4		0.50
Chi-01-044	0.0343 ± 0.0005		0.2519 ± 0.0127		217.6 ± 3.4		228.1 ± 11.5		0.77
Chi-01-045	0.3263 ± 0.0044		5.1974 ± 0.1427		1820.3 ± 24.3		1852.1 ± 50.9		1.08
Chi-01-046	0.0267 ± 0.0004		0.1851 ± 0.0073		170.1 ± 2.3		172.4 ± 6.8		0.21
Chi-01-047	0.0405 ± 0.0006		0.2790 ± 0.0124		255.8 ± 3.7		249.8 ± 11.1		0.51
Chi-01-048	0.3319 ± 0.0040		5.4632 ± 0.1105		1847.7 ± 22.3		1894.8 ± 38.3		0.25

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	<sup>206</sup> Pb/ <sup>238</sup> U	Error 1σ	<sup>207</sup> Pb/ <sup>235</sup> U	Error 1σ	<sup>206</sup> Pb/ <sup>238</sup> U	Error 1σ	<sup>207</sup> Pb/ <sup>235</sup> U	Error 1σ	
Chi-01-049	0.3418 ± 0.0041		5.4887 ± 0.1113		1895.4 ± 22.9		1898.8 ± 38.5		0.63
Chi-01-050	0.2910 ± 0.0040		4.5009 ± 0.0790		1646.6 ± 22.8		1731.1 ± 30.4		0.17
Chi-01-051	0.0365 ± 0.0005		0.2779 ± 0.0088		231.3 ± 3.4		249.0 ± 7.9		1.59
Chi-01-052	0.3223 ± 0.0044		5.1475 ± 0.0881		1800.8 ± 24.8		1843.9 ± 31.5		0.14
Chi-01-053	0.3321 ± 0.0045		5.4479 ± 0.0891		1848.6 ± 25.3		1892.4 ± 30.9		0.85
Chi-01-054	0.3395 ± 0.0048		5.4236 ± 0.1023		1884.1 ± 26.4		1888.5 ± 35.6		0.17
Chi-01-055	0.0299 ± 0.0005		0.2102 ± 0.0111		190.2 ± 3.3		193.7 ± 10.2		0.47
Chi-01-056	0.0392 ± 0.0005		0.2833 ± 0.0116		247.9 ± 3.0		253.3 ± 10.4		0.72
Chi-01-057	0.0404 ± 0.0005		0.2903 ± 0.0140		255.2 ± 3.4		258.8 ± 12.5		0.65
Chi-01-058	0.4321 ± 0.0042		9.0763 ± 0.1614		2315.3 ± 22.3		2345.6 ± 41.7		0.17
Chi-01-059	0.3172 ± 0.0034		5.1674 ± 0.1236		1776.1 ± 19.1		1847.2 ± 44.2		0.95
Chi-01-060	0.0949 ± 0.0009		1.6194 ± 0.0323		584.3 ± 5.8		977.7 ± 19.5		0.30
Chi-01-061	0.0295 ± 0.0004		0.2061 ± 0.0105		187.3 ± 2.6		190.3 ± 9.7		0.38
Chi-01-062	0.0405 ± 0.0006		0.3074 ± 0.0174		255.8 ± 3.9		272.2 ± 15.4		0.46
Chi-01-063	0.3581 ± 0.0033		6.4331 ± 0.1074		1973.1 ± 18.4		2036.7 ± 34.0		0.15
Chi-01-064	0.4106 ± 0.0055		7.7363 ± 0.1670		2217.8 ± 30.0		2200.7 ± 47.5		0.39
Chi-01-065	0.0383 ± 0.0007		0.2943 ± 0.0162		242.6 ± 4.2		261.9 ± 14.4		0.57
Chi-01-066	0.0335 ± 0.0005		0.2356 ± 0.0072		212.6 ± 3.0		214.8 ± 6.6		0.50
Chi-01-067	0.3451 ± 0.0048		5.6269 ± 0.1403		1911.3 ± 26.8		1920.2 ± 47.9		1.18
Chi-01-068	0.0294 ± 0.0004		0.2029 ± 0.0077		186.8 ± 2.8		187.5 ± 7.1		0.80
Chi-01-069	0.0403 ± 0.0007		0.3068 ± 0.0151		254.4 ± 4.2		271.7 ± 13.3		0.62
Chi-01-070	0.3787 ± 0.0050		6.6857 ± 0.1348		2070.2 ± 27.4		2070.7 ± 41.8		0.11
Chi-01-071	0.3309 ± 0.0048		5.1854 ± 0.0928		1842.5 ± 26.6		1850.2 ± 33.1		0.37
Chi-01-072	0.0395 ± 0.0007		0.2831 ± 0.0168		249.6 ± 4.7		253.1 ± 15.0		0.48
Chi-01-073	0.0411 ± 0.0008		0.2648 ± 0.0171		259.9 ± 4.9		238.5 ± 15.4		0.49
Chi-01-074	0.0407 ± 0.0008		0.2770 ± 0.0169		257.3 ± 4.8		248.3 ± 15.1		0.48
Chi-01-075	0.0381 ± 0.0008		0.2880 ± 0.0209		241.3 ± 5.0		257.0 ± 18.7		0.41
Chi-01-076	0.3339 ± 0.0050		5.1909 ± 0.1028		1857.0 ± 27.7		1851.1 ± 36.7		0.26
Chi-01-077	0.3206 ± 0.0047		5.4335 ± 0.0965		1792.5 ± 26.2		1890.1 ± 33.6		0.19
Chi-01-078	0.0406 ± 0.0006		0.3043 ± 0.0121		256.7 ± 3.8		269.8 ± 10.7		0.40
Chi-01-079	0.3224 ± 0.0047		4.9937 ± 0.1425		1801.7 ± 26.2		1818.2 ± 51.9		1.40
Chi-01-080	0.0404 ± 0.0006		0.2891 ± 0.0095		255.1 ± 3.5		257.9 ± 8.4		0.40
Chi-01-081	0.0401 ± 0.0007		0.2620 ± 0.0153		253.4 ± 4.3		236.3 ± 13.8		0.54
Chi-01-082	0.3377 ± 0.0045		5.2455 ± 0.1155		1875.8 ± 24.8		1860.0 ± 41.0		0.29
Chi-01-083	0.0577 ± 0.0013		0.4413 ± 0.0392		361.7 ± 8.4		371.1 ± 33.0		0.56
Chi-01-084	0.0367 ± 0.0006		0.2487 ± 0.0111		232.5 ± 3.5		225.5 ± 10.0		0.47
Chi-01-085	0.3273 ± 0.0022		5.0877 ± 0.0701		1825.1 ± 12.1		1834.0 ± 25.3		0.16
Chi-01-086	0.3246 ± 0.0025		5.1685 ± 0.0831		1812.1 ± 13.8		1847.4 ± 29.7		0.64
Chi-01-087	0.0397 ± 0.0006		0.3000 ± 0.0102		251.2 ± 3.6		266.4 ± 9.1		0.73
Chi-01-088	0.3401 ± 0.0025		5.4318 ± 0.0859		1887.0 ± 14.1		1889.8 ± 29.9		0.81
Chi-01-089	0.3228 ± 0.0029		4.9872 ± 0.0945		1803.4 ± 16.1		1817.1 ± 34.4		0.77
Chi-01-090	0.3297 ± 0.0034		5.2802 ± 0.1129		1837.0 ± 19.0		1856.6 ± 39.9		1.08
Chi-01-091	0.3453 ± 0.0020		5.3650 ± 0.0622		1912.2 ± 11.3		1879.2 ± 21.8		0.09
Chi-01-092	0.0278 ± 0.0003		0.1930 ± 0.0057		176.6 ± 1.9		179.1 ± 5.3		0.50
Chi-01-093	0.0405 ± 0.0004		0.2749 ± 0.0081		255.9 ± 2.8		246.6 ± 7.3		0.27
Chi-01-094	0.3275 ± 0.0031		5.2241 ± 0.0840		1826.4 ± 17.6		1856.5 ± 29.9		0.17
Chi-01-095	0.2198 ± 0.0022		3.2881 ± 0.0632		1281.0 ± 12.9		1478.2 ± 28.4		0.21
Chi-01-096	0.3832 ± 0.0043		6.9535 ± 0.1659		2091.2 ± 23.6		2105.4 ± 50.2		0.67
Chi-01-097	0.3506 ± 0.0034		6.0283 ± 0.0957		1937.5 ± 18.6		1979.9 ± 31.4		0.15

## Appendix 2

Grain No.	Isotopic ratios		Age (Ma)		Age (Ma)		Age (Ma)		Th/U
	$^{206}\text{Pb}/^{238}\text{U}$	Error $1\sigma$	$^{207}\text{Pb}/^{235}\text{U}$	Error $1\sigma$	$^{206}\text{Pb}/^{238}\text{U}$	Error $1\sigma$	$^{207}\text{Pb}/^{235}\text{U}$	Error $1\sigma$	
Chi-01-098	0.0390 ± 0.0004		0.2787 ± 0.0072		246.8 ± 2.6		249.6 ± 6.4		0.36
Chi-01-099	0.3730 ± 0.0035		7.1349 ± 0.1033		2043.7 ± 19.2		2128.3 ± 30.8		0.43
Chi-01-100	0.3396 ± 0.0038		5.3512 ± 0.1179		1884.7 ± 21.2		1877.0 ± 41.4		1.03
Chi-01-101	0.3325 ± 0.0040		5.0799 ± 0.1322		1850.6 ± 22.2		1832.7 ± 47.7		1.53
Chi-01-102	0.4191 ± 0.0044		9.1084 ± 0.1527		2256.3 ± 23.4		2348.9 ± 39.4		0.30
Chi-01-103	0.0391 ± 0.0007		0.3162 ± 0.0208		247.5 ± 4.4		279.0 ± 18.3		0.54
Chi-01-104	0.0422 ± 0.0006		0.4017 ± 0.0169		266.2 ± 3.7		342.9 ± 14.5		0.52
Chi-01-105	0.0415 ± 0.0009		0.3208 ± 0.0284		262.2 ± 5.8		282.5 ± 25.0		0.46
Chi-01-106	0.0401 ± 0.0008		0.3130 ± 0.0235		253.6 ± 4.9		276.5 ± 20.8		0.76
Chi-01-107	0.0308 ± 0.0005		0.2338 ± 0.0141		195.5 ± 3.0		213.4 ± 12.8		0.49
Chi-01-108	0.3251 ± 0.0027		5.1975 ± 0.0834		1814.8 ± 15.3		1852.1 ± 29.7		0.25
Chi-01-109	0.0397 ± 0.0005		0.2780 ± 0.0132		251.0 ± 3.2		249.1 ± 11.9		0.70
Chi-01-110	0.0367 ± 0.0004		0.4304 ± 0.0151		232.3 ± 2.7		363.4 ± 12.7		0.69
Chi-01-111	0.4290 ± 0.0035		8.8070 ± 0.1275		2301.3 ± 18.9		2318.1 ± 33.6		0.37
Chi-01-112	0.3428 ± 0.0029		5.6046 ± 0.0870		1900.0 ± 15.9		1916.7 ± 29.8		0.12
Chi-01-113	0.0397 ± 0.0005		0.2922 ± 0.0136		251.0 ± 3.2		260.3 ± 12.1		0.58
Chi-01-114	0.0367 ± 0.0003		0.2655 ± 0.0073		232.1 ± 2.2		239.1 ± 6.6		0.74
Chi-01-115	0.0437 ± 0.0007		0.3461 ± 0.0175		275.9 ± 4.7		301.7 ± 15.2		0.49
Chi-01-116	0.3670 ± 0.0051		5.7847 ± 0.1291		2015.2 ± 28.1		1944.1 ± 43.4		0.44
Chi-01-117	0.0428 ± 0.0008		0.3210 ± 0.0207		269.9 ± 5.2		282.6 ± 18.2		0.83
Chi-01-118	0.0325 ± 0.0007		0.2156 ± 0.0167		206.5 ± 4.3		198.2 ± 15.4		0.59
Chi-01-119	0.3515 ± 0.0053		5.2355 ± 0.1498		1941.9 ± 29.0		1858.4 ± 53.2		1.16
Chi-01-120	0.3591 ± 0.0049		5.8230 ± 0.1220		1978.0 ± 27.2		1949.8 ± 40.8		0.16
Chi-01-121	0.3624 ± 0.0051		5.9030 ± 0.1319		1993.5 ± 27.8		1961.6 ± 43.8		0.15
Chi-01-122	0.3532 ± 0.0040		5.3407 ± 0.1162		1949.9 ± 22.1		1875.3 ± 40.8		1.19
Chi-01-123	0.0302 ± 0.0004		0.2183 ± 0.0107		191.9 ± 2.7		200.5 ± 9.8		0.40
Chi-01-124	0.3540 ± 0.0038		5.4544 ± 0.0976		1953.5 ± 20.8		1893.4 ± 33.9		0.24
Chi-01-125	0.0430 ± 0.0005		0.2951 ± 0.0081		271.7 ± 3.1		262.6 ± 7.2		0.40
Chi-01-126	0.0437 ± 0.0006		0.3361 ± 0.0131		275.8 ± 3.6		294.2 ± 11.4		0.36
Chi-01-127	0.0322 ± 0.0005		0.2213 ± 0.0107		204.2 ± 2.9		203.0 ± 9.8		0.46
Chi-01-128	0.3762 ± 0.0037		5.9627 ± 0.1022		2058.5 ± 20.0		1970.3 ± 33.8		0.24
Chi-01-129	0.4081 ± 0.0041		6.8074 ± 0.1229		2206.4 ± 21.9		2086.6 ± 37.7		0.38
Chi-01-130	0.3338 ± 0.0031		5.1887 ± 0.0794		1856.6 ± 17.5		1850.7 ± 28.3		0.12
Chi-01-131	0.3732 ± 0.0037		5.9531 ± 0.1115		2044.6 ± 20.5		1968.9 ± 36.9		0.44
Chi-01-132	0.0427 ± 0.0008		0.3238 ± 0.0248		269.7 ± 5.1		284.8 ± 21.9		0.48
Chi-01-133	0.0343 ± 0.0004		0.2362 ± 0.0100		217.4 ± 2.7		215.3 ± 9.1		0.62
Chi-01-134	0.3539 ± 0.0033		5.7061 ± 0.0813		1953.0 ± 18.1		1932.2 ± 27.5		0.52
Chi-01-135	0.3541 ± 0.0034		5.6729 ± 0.0883		1954.0 ± 18.5		1927.2 ± 30.0		0.25
Chi-01-136	0.0339 ± 0.0015		0.2488 ± 0.0185		214.9 ± 9.5		225.6 ± 16.7		0.51
Chi-01-137	0.3763 ± 0.0056		6.2278 ± 0.1458		2058.9 ± 30.7		2008.3 ± 47.0		0.67
Chi-01-138	0.3489 ± 0.0040		5.4842 ± 0.0912		1929.5 ± 22.2		1898.1 ± 31.6		0.15
Chi-01-139	0.3555 ± 0.0041		5.7618 ± 0.0958		1960.7 ± 22.6		1940.6 ± 32.3		0.17
Chi-01-140	0.0316 ± 0.0008		0.2278 ± 0.0108		200.6 ± 5.3		208.4 ± 9.9		0.82
Chi-01-141	0.3992 ± 0.0043		7.3075 ± 0.1060		2165.2 ± 23.6		2149.7 ± 31.2		0.21
Chi-01-142	0.3775 ± 0.0050		6.0300 ± 0.1228		2064.8 ± 27.3		1980.1 ± 40.3		0.18
Chi-02 (GPS: 35° 29' 18.39" N, 138° 04' 00.53" E)									
Chi-02-001	0.0295 ± 0.0004		0.1989 ± 0.0069		187.4 ± 2.4		184.2 ± 6.4		0.66
Chi-02-002	0.0391 ± 0.0005		0.2620 ± 0.0110		247.0 ± 3.4		236.3 ± 9.9		0.42

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Chi-02-003	0.0394 ± 0.0007		1.3916 ± 0.0466		249.4 ± 2.1		885.3 ± 29.7		0.72
Chi-02-004	0.3229 ± 0.0036		5.1155 ± 0.0738		1803.7 ± 19.9		1838.6 ± 26.5		0.35
Chi-02-005	0.3290 ± 0.0036		5.3308 ± 0.0786		1833.6 ± 20.3		1873.7 ± 27.6		0.65
Chi-02-006	0.0259 ± 0.0005		0.1696 ± 0.0127		164.6 ± 3.0		159.1 ± 12.0		0.48
Chi-02-007	0.3501 ± 0.0029		6.1170 ± 0.0839		1935.3 ± 16.1		1992.6 ± 27.3		0.12
Chi-02-008	0.3949 ± 0.0031		7.6879 ± 0.0974		2145.6 ± 16.9		2195.1 ± 27.8		0.36
Chi-02-009	0.3364 ± 0.0030		5.3068 ± 0.0806		1869.1 ± 16.9		1869.9 ± 28.4		0.13
Chi-02-010	0.3297 ± 0.0045		5.2706 ± 0.1112		1837.1 ± 25.0		1864.1 ± 39.3		0.31
Chi-02-011	0.3301 ± 0.0030		5.2912 ± 0.0810		1838.9 ± 16.8		1867.4 ± 28.6		0.13
Chi-02-012	0.0297 ± 0.0004		0.2193 ± 0.0095		188.9 ± 2.3		201.3 ± 8.7		0.33
Chi-02-013	0.0444 ± 0.0017		0.4443 ± 0.0401		280.2 ± 5.4		373.3 ± 33.7		0.43
Chi-02-014	0.0333 ± 0.0005		0.2359 ± 0.0109		210.9 ± 3.0		215.0 ± 9.9		0.71
Chi-02-015	0.3413 ± 0.0037		5.2649 ± 0.0855		1893.1 ± 20.4		1863.1 ± 30.2		0.23
Chi-02-016	0.0290 ± 0.0004		0.2009 ± 0.0075		184.3 ± 2.4		185.9 ± 7.0		0.53
Chi-02-017	0.2448 ± 0.0027		4.2582 ± 0.0752		1411.5 ± 7.8		1685.3 ± 29.8		0.39
Chi-02-018	0.0441 ± 0.0007		0.3337 ± 0.0181		278.3 ± 4.3		292.4 ± 15.9		0.34
Chi-02-019	0.0384 ± 0.0006		0.2727 ± 0.0134		243.1 ± 3.5		244.9 ± 12.1		0.12
Chi-02-020	0.0303 ± 0.0004		0.2069 ± 0.0066		192.5 ± 2.3		190.9 ± 6.1		0.55
Chi-02-021	0.4619 ± 0.0034		10.1783 ± 0.1311		2448.1 ± 18.0		2451.0 ± 31.6		0.56
Chi-02-022	0.4229 ± 0.0031		9.1007 ± 0.1160		2273.5 ± 16.6		2348.1 ± 29.9		0.65
Chi-02-023	0.0394 ± 0.0004		0.2870 ± 0.0116		249.2 ± 2.7		256.2 ± 10.3		0.54
Chi-02-024	0.0441 ± 0.0004		0.3222 ± 0.0083		278.3 ± 2.4		283.6 ± 7.3		0.81
Chi-02-025	0.0269 ± 0.0003		0.1895 ± 0.0064		171.4 ± 1.7		176.2 ± 6.0		0.27
Chi-02-026	0.0292 ± 0.0004		0.2051 ± 0.0111		185.8 ± 2.5		189.4 ± 10.2		0.76
Chi-02-027	0.0358 ± 0.0003		0.2524 ± 0.0069		227.0 ± 2.0		228.5 ± 6.3		0.44
Chi-02-028	0.4370 ± 0.0037		9.4747 ± 0.1421		2337.3 ± 19.6		2385.0 ± 35.8		1.03
Chi-02-029	0.3658 ± 0.0030		6.5129 ± 0.0962		2009.7 ± 16.6		2047.6 ± 30.2		0.13
Chi-02-030	0.0268 ± 0.0003		0.1899 ± 0.0082		170.7 ± 2.0		176.5 ± 7.6		0.84
Chi-02-031	0.4063 ± 0.0033		7.9540 ± 0.1148		2197.8 ± 18.1		2225.7 ± 32.1		0.57
Chi-02-032	0.3348 ± 0.0028		5.2339 ± 0.0820		1861.6 ± 15.6		1858.1 ± 29.1		0.54
Chi-02-033	0.4659 ± 0.0038		10.3448 ± 0.1472		2465.6 ± 20.3		2466.0 ± 35.1		0.16
Chi-02-034	0.0387 ± 0.0004		0.2637 ± 0.0105		244.6 ± 2.7		237.7 ± 9.5		0.97
Chi-02-035	0.3405 ± 0.0019		5.2236 ± 0.0635		1889.0 ± 10.3		1856.4 ± 22.6		0.23
Chi-02-036	0.0285 ± 0.0003		0.1777 ± 0.0100		181.2 ± 2.2		166.1 ± 9.3		0.52
Chi-02-037	0.3457 ± 0.0022		5.4921 ± 0.0852		1914.0 ± 12.0		1899.3 ± 29.5		0.16
Chi-02-038	0.0324 ± 0.0004		0.2081 ± 0.0128		205.5 ± 2.7		191.9 ± 11.8		0.45
Chi-02-039	0.0389 ± 0.0003		0.2694 ± 0.0086		246.1 ± 2.0		242.2 ± 7.7		0.37
Chi-02-040	0.4787 ± 0.0026		11.0090 ± 0.1267		2521.6 ± 13.9		2523.8 ± 29.1		0.79
Chi-02-041	0.4529 ± 0.0025		10.3969 ± 0.1162		2408.3 ± 13.1		2470.7 ± 27.6		0.78
Chi-02-042	0.0389 ± 0.0002		0.2711 ± 0.0048		246.0 ± 1.4		243.6 ± 4.3		0.12
Chi-02-043	0.0299 ± 0.0006		0.2117 ± 0.0172		190.2 ± 3.7		194.9 ± 15.8		0.47
Chi-02-044	0.4582 ± 0.0052		10.0738 ± 0.1954		2431.5 ± 27.7		2441.5 ± 47.4		0.61
Chi-02-045	0.3500 ± 0.0039		5.7885 ± 0.1053		1934.5 ± 21.4		1944.6 ± 35.4		0.32
Chi-02-046	0.3364 ± 0.0037		5.3435 ± 0.0995		1869.4 ± 20.7		1875.8 ± 34.9		0.18
Chi-02-047	0.0384 ± 0.0006		0.2784 ± 0.0168		243.1 ± 4.0		249.4 ± 15.1		0.70
Chi-02-048	0.0324 ± 0.0005		0.2210 ± 0.0130		205.7 ± 3.3		202.8 ± 11.9		0.90
Chi-02-049	0.0393 ± 0.0008		0.2730 ± 0.0226		248.2 ± 4.9		245.1 ± 20.3		0.49
Chi-02-050	0.3318 ± 0.0037		5.1995 ± 0.0967		1847.1 ± 20.5		1852.5 ± 34.5		0.57
Chi-02-051	0.3316 ± 0.0046		5.2326 ± 0.0992		1846.1 ± 25.7		1857.9 ± 35.2		0.26

## Appendix 3

Grain No.	Isotopic ratios		Age (Ma)		Th/U		
	$^{206}\text{Pb}/^{238}\text{U}$	Error $1\sigma$	$^{207}\text{Pb}/^{235}\text{U}$	Error $1\sigma$			
Chi-02-052	0.3719	± 0.0054	9.5331	± 0.2069	2038.1 ± 14.9	2390.7 ± 51.9	0.51
Chi-02-053	0.0400	± 0.0006	0.2885	± 0.0119	252.7 ± 4.0	257.4 ± 10.6	0.25
Chi-02-054	0.3369	± 0.0047	5.2763	± 0.0976	1871.9 ± 26.0	1865.0 ± 34.5	0.51
Chi-02-055	0.3381	± 0.0047	5.9592	± 0.1132	1877.5 ± 26.2	1969.8 ± 37.4	0.38
Chi-02-056	0.3434	± 0.0047	5.4338	± 0.0955	1902.9 ± 26.2	1890.1 ± 33.2	0.36
Chi-02-057	0.0334	± 0.0005	0.2378	± 0.0057	211.6 ± 3.0	216.6 ± 5.2	0.82
Chi-02-058	0.3390	± 0.0048	5.3534	± 0.1078	1881.6 ± 26.5	1877.4 ± 37.8	0.39
Chi-02-059	0.3269	± 0.0028	5.0008	± 0.0716	1823.4 ± 15.5	1819.4 ± 26.0	0.27
Chi-02-060	0.0348	± 0.0003	0.2394	± 0.0060	220.4 ± 2.0	217.9 ± 5.5	0.40
Chi-02-061	0.0248	± 0.0002	0.1838	± 0.0051	158.2 ± 1.5	171.3 ± 4.7	0.74
Chi-02-062	0.3769	± 0.0031	6.4676	± 0.0798	2061.6 ± 17.0	2041.4 ± 25.2	0.53
Chi-02-063	0.0328	± 0.0005	0.2739	± 0.0145	207.9 ± 1.5	245.8 ± 13.0	0.40
Chi-02-064	0.0397	± 0.0004	0.2713	± 0.0085	251.0 ± 2.5	243.7 ± 7.6	0.37
Chi-02-065	0.0431	± 0.0005	0.3384	± 0.0153	271.9 ± 3.4	296.0 ± 13.4	0.54
Chi-02-066	0.0345	± 0.0005	0.2882	± 0.0142	218.7 ± 1.5	257.1 ± 12.7	0.47
Chi-02-067	0.0345	± 0.0005	0.2308	± 0.0113	218.9 ± 3.2	210.9 ± 10.4	0.62
Chi-02-068	0.3894	± 0.0042	6.9942	± 0.1130	2119.9 ± 23.1	2110.6 ± 34.1	0.11
Chi-02-069	0.0271	± 0.0004	0.1651	± 0.0081	172.3 ± 1.2	155.2 ± 7.6	0.47
Chi-02-070	0.0300	± 0.0004	0.2050	± 0.0105	190.5 ± 2.8	189.3 ± 9.7	0.61
Chi-02-071	0.3405	± 0.0038	5.3011	± 0.0961	1889.0 ± 21.1	1869.0 ± 33.9	0.72
Chi-02-072	0.0429	± 0.0006	0.3300	± 0.0151	270.7 ± 3.9	289.5 ± 13.2	0.30
Chi-02-073	0.3118	± 0.0034	4.7678	± 0.0774	1749.7 ± 19.0	1779.2 ± 28.9	0.19
Chi-02-074	0.4584	± 0.0052	9.5622	± 0.1755	2432.7 ± 27.6	2393.5 ± 43.9	0.16
Chi-02-075	0.0428	± 0.0007	0.3644	± 0.0241	269.9 ± 2.4	315.5 ± 20.9	0.50
Chi-02-076	0.0541	± 0.0006	0.3966	± 0.0117	339.5 ± 3.5	339.2 ± 10.0	0.55
Chi-02-077	0.3256	± 0.0031	5.0999	± 0.0971	1817.0 ± 17.5	1836.0 ± 35.0	0.38
Chi-02-078	0.4883	± 0.0045	10.9346	± 0.1811	2563.5 ± 23.7	2517.5 ± 41.7	0.50
Chi-02-079	0.0427	± 0.0005	0.3144	± 0.0135	269.4 ± 3.4	277.6 ± 11.9	0.13
Chi-02-080	0.0268	± 0.0003	0.1927	± 0.0084	170.7 ± 2.2	179.0 ± 7.8	0.53
Chi-02-081	0.0344	± 0.0005	0.2292	± 0.0123	218.0 ± 3.1	209.5 ± 11.2	0.78
Chi-02-082	0.0293	± 0.0006	0.1971	± 0.0118	186.0 ± 3.6	182.7 ± 11.0	0.53
Chi-02-083	0.0290	± 0.0005	0.2023	± 0.0081	184.3 ± 3.2	187.1 ± 7.4	0.57
Chi-02-084	0.0286	± 0.0006	0.1861	± 0.0122	181.6 ± 3.7	173.3 ± 11.4	0.61
Chi-02-085	0.0332	± 0.0006	0.2464	± 0.0139	210.4 ± 4.1	223.7 ± 12.6	0.57
Chi-02-086	0.0287	± 0.0005	0.1907	± 0.0103	182.6 ± 3.4	177.3 ± 9.6	0.60
Chi-02-087	0.0285	± 0.0005	0.1999	± 0.0099	180.9 ± 3.3	185.1 ± 9.2	0.45
Chi-02-088	0.0614	± 0.0011	0.3176	± 0.0175	384.4 ± 3.3	280.0 ± 15.4	1.00
Chi-02-089	0.0388	± 0.0006	0.2922	± 0.0089	245.3 ± 3.8	260.3 ± 7.9	0.62
Chi-02-090	0.0415	± 0.0007	0.3202	± 0.0147	262.4 ± 4.5	282.0 ± 12.9	0.72
Chi-02-091	0.3615	± 0.0052	6.1855	± 0.1093	1989.4 ± 28.9	2002.3 ± 35.4	0.19
Chi-02-092	0.4469	± 0.0068	9.8632	± 0.2128	2381.4 ± 36.2	2422.0 ± 52.3	0.84
Chi-02-093	0.0385	± 0.0006	0.2950	± 0.0160	243.3 ± 4.1	262.4 ± 14.3	0.80
Chi-02-094	0.3386	± 0.0043	5.3906	± 0.1153	1879.9 ± 24.1	1883.3 ± 40.3	0.29
Chi-02-095	0.4638	± 0.0056	11.0976	± 0.1837	2456.5 ± 29.8	2531.3 ± 41.9	0.10
Chi-02-096	0.0285	± 0.0005	0.1972	± 0.0114	180.9 ± 3.1	182.7 ± 10.6	0.58
Chi-02-097	0.3405	± 0.0042	5.2972	± 0.0970	1889.3 ± 23.3	1868.3 ± 34.2	0.30
Chi-02-098	0.0271	± 0.0004	0.1942	± 0.0061	172.6 ± 2.3	180.2 ± 5.6	0.83
Chi-02-099	0.0283	± 0.0004	0.2037	± 0.0068	179.9 ± 2.4	188.2 ± 6.3	0.63
Chi-02-100	0.3387	± 0.0049	5.4400	± 0.1114	1880.6 ± 27.2	1891.1 ± 38.7	0.17

Grain No.	Isotopic ratios		Age (Ma)		Th/U		
	$^{206}\text{Pb}/^{238}\text{U}$	Error $1\sigma$	$^{207}\text{Pb}/^{235}\text{U}$	Error $1\sigma$			
Chi-02-101	0.0489	± 0.0008	0.3845	± 0.0147	307.6 ± 4.9	330.3 ± 12.6	0.38
Chi-02-102	0.0293	± 0.0004	0.1994	± 0.0063	186.2 ± 2.8	184.6 ± 5.8	0.26
Chi-02-103	0.0455	± 0.0010	0.3361	± 0.0266	287.1 ± 6.3	294.2 ± 23.3	0.43
Chi-02-104	0.0261	± 0.0004	0.1787	± 0.0054	165.9 ± 2.5	166.9 ± 5.1	0.61
Chi-02-105	0.0314	± 0.0009	0.3903	± 0.0374	199.5 ± 2.9	334.6 ± 32.1	0.63
Chi-02-106	0.0263	± 0.0005	0.1801	± 0.0102	167.2 ± 3.0	168.1 ± 9.5	0.46
Chi-02-107	0.0262	± 0.0004	0.1729	± 0.0049	166.9 ± 2.5	162.0 ± 4.6	0.65
Chi-02-108	0.4580	± 0.0045	10.2164	± 0.1719	2430.5 ± 23.6	2454.5 ± 41.3	0.80
Chi-02-109	0.4218	± 0.0043	8.7639	± 0.1617	2268.8 ± 23.0	2313.7 ± 42.7	0.60
Chi-02-110	0.0327	± 0.0004	0.2297	± 0.0073	207.6 ± 2.3	210.0 ± 6.7	0.40
Chi-02-111	0.3823	± 0.0039	6.5471	± 0.1226	2086.8 ± 21.1	2052.2 ± 38.4	0.33
Chi-02-112	0.0299	± 0.0004	0.2701	± 0.0112	189.9 ± 1.3	242.8 ± 10.1	0.97
Chi-02-113	0.0608	± 0.0007	0.5305	± 0.0190	380.3 ± 2.3	432.1 ± 15.5	0.51
Chi-02-114	0.0297	± 0.0003	0.1987	± 0.0054	188.4 ± 2.1	184.0 ± 5.0	0.30
Chi-02-115	0.4738	± 0.0049	11.3959	± 0.1539	2500.1 ± 25.9	2556.0 ± 34.5	1.00
Chi-02-116	0.0293	± 0.0005	0.1854	± 0.0088	186.1 ± 3.5	172.7 ± 8.2	0.45
Chi-02-117	0.0311	± 0.0005	0.2106	± 0.0073	197.1 ± 3.5	194.1 ± 6.7	0.50
Chi-02-118	0.0312	± 0.0007	0.2059	± 0.0158	197.9 ± 4.4	190.1 ± 14.6	0.64
Chi-02-119	0.0331	± 0.0006	0.2428	± 0.0075	210.1 ± 3.6	220.7 ± 6.8	0.92
Chi-02-120	0.3457	± 0.0058	5.4265	± 0.1104	1913.9 ± 32.0	1889.0 ± 38.4	0.46
Chi-02-121	0.0328	± 0.0006	0.2309	± 0.0080	208.0 ± 3.7	210.9 ± 7.3	0.52
Chi-02-122	0.4438	± 0.0074	8.8869	± 0.1734	2367.7 ± 39.4	2326.4 ± 45.4	0.34
Chi-02-123	0.0319	± 0.0006	0.2322	± 0.0089	202.7 ± 3.5	212.0 ± 8.1	0.52
Chi-02-124	0.0334	± 0.0006	0.2275	± 0.0091	211.7 ± 3.7	208.1 ± 8.3	0.35
Chi-02-125	0.0301	± 0.0005	0.2033	± 0.0054	191.1 ± 3.1	187.9 ± 5.0	1.07
Chi-02-126	0.0467	± 0.0010	0.2821	± 0.0232	294.1 ± 3.2	252.3 ± 20.7	0.49
Chi-02-127	0.0432	± 0.0009	0.3021	± 0.0193	272.9 ± 5.5	268.1 ± 17.1	0.54
Chi-02-128	0.3496	± 0.0056	5.3748	± 0.1104	1932.5 ± 30.9	1880.8 ± 38.6	0.43
Chi-02-129	0.4618	± 0.0075	10.0389	± 0.2167	2447.6 ± 39.7	2438.3 ± 52.6	0.40
Chi-02-130	0.3456	± 0.0055	5.4406	± 0.1135	1913.7 ± 30.7	1891.2 ± 39.5	0.30
Chi-02-131	0.3457	± 0.0066	5.4484	± 0.1142	1914.1 ± 36.3	1892.4 ± 39.7	0.35
Chi-02-132	0.4647	± 0.0089	9.7780	± 0.2099	2460.1 ± 46.9	2414.0 ± 51.8	0.52
Chi-02-133	0.0299	± 0.0007	0.2088	± 0.0122	189.8 ± 4.2	192.5 ± 11.3	0.39
Chi-02-134	0.0420	± 0.0008	0.2871	± 0.0075	265.4 ± 5.1	256.2 ± 6.7	0.26
Chi-02-135	0.0292	± 0.0006	0.2125	± 0.0093	185.9 ± 3.8	195.7 ± 8.6	0.57
Chi-02-136	0.5110	± 0.0098	11.4145	± 0.2598	2661.1 ± 51.2	2557.5 ± 58.2	0.41
Chi-02-137	0.3788	± 0.0072	5.9982	± 0.1279	2070.5 ± 39.3	1975.5 ± 42.1	0.22
Chi-02-138	0.2679	± 0.0051	3.8619	± 0.0837	1530.0 ± 29.1	1605.7 ± 34.8	0.18
Chi-02-139	0.4814	± 0.0106	10.1918	± 0.3054	2533.3 ± 55.6	2452.3 ± 73.5	0.39
Chi-02-140	0.0320	± 0.0007	0.2087	± 0.0073	202.8 ± 4.4	192.4 ± 6.8	0.60
Chi-02-141	0.3538	± 0.0076	5.4341	± 0.1464	1952.9 ± 41.8	1890.2 ± 50.9	0.40
Chi-02-142	0.0416	± 0.0010	0.2894	± 0.0141	262.8 ± 6.0	258.1 ± 12.5	0.55
Chi-02-143	0.0292	± 0.0006	0.1997	± 0.0068	185.7 ± 4.0	184.9 ± 6.3	0.69
Chi-02-144	0.0333	± 0.0007	0.2338	± 0.0077	211.3 ± 4.6	213.3 ± 7.0	0.93
Chi-02-145	0.3785	± 0.0082	6.1427	± 0.1750	2069.4 ± 44.7	1996.3 ± 56.9	0.37
Chi-02-146	0.0407	± 0.0009	0.2849	± 0.0109	257.4 ± 5.7	254.5 ± 9.7	0.13
Chi-03 (GPS: 35° 27' 37.65" N, 138° 03' 42.08" E)							
Chi-03-001	0.2771	± 0.005	4.2688	± 0.0914	1576.9 ± 26.8	1687.3 ± 36.1	0.10

Appendix 4

Grain No.	Isotopic ratios		Age (Ma)				Th/U		
	<sup>206</sup> Pb/ <sup>238</sup> U	Error 1σ	<sup>207</sup> Pb/ <sup>235</sup> U	Error 1σ	<sup>206</sup> Pb/ <sup>238</sup> U	Error 1σ		<sup>207</sup> Pb/ <sup>235</sup> U	Error 1σ
Chi-03-002	0.0283 ± 0.001		0.1751 ± 0.0111		179.7 ± 3.8		163.9 ± 10.4		0.52
Chi-03-003	0.0280 ± 0.001		0.1975 ± 0.0094		178.3 ± 3.4		183.0 ± 8.7		0.40
Chi-03-004	0.3368 ± 0.006		5.3465 ± 0.1133		1871.1 ± 31.8		1876.3 ± 39.8		0.30
Chi-03-005	0.0550 ± 0.001		0.4445 ± 0.0271		345.4 ± 7.4		373.4 ± 22.8		0.79
Chi-03-006	0.0296 ± 0.001		0.2039 ± 0.0091		187.7 ± 3.5		188.4 ± 8.4		0.49
Chi-03-007	0.3657 ± 0.006		6.3072 ± 0.1124		2009.3 ± 34.0		2019.4 ± 36.0		0.38
Chi-03-008	0.3325 ± 0.006		5.2992 ± 0.1173		1850.4 ± 32.4		1868.7 ± 41.4		1.03
Chi-03-009	0.0292 ± 0.000		0.1970 ± 0.0060		185.3 ± 2.3		182.6 ± 5.6		0.18
Chi-03-010	0.3422 ± 0.004		5.2589 ± 0.1178		1897.4 ± 22.5		1862.1 ± 41.7		0.27
Chi-03-011	0.0269 ± 0.000		0.1748 ± 0.0080		171.3 ± 2.4		163.6 ± 7.5		0.32
Chi-03-012	0.0272 ± 0.000		0.2036 ± 0.0065		173.2 ± 2.2		188.2 ± 6.0		0.80
Chi-03-013	0.4393 ± 0.005		9.2298 ± 0.2008		2347.7 ± 27.9		2361.0 ± 51.4		0.77
Chi-03-014	0.3355 ± 0.004		5.1616 ± 0.1049		1864.9 ± 21.2		1846.2 ± 37.5		0.24
Chi-03-015	0.0261 ± 0.000		0.1761 ± 0.0081		166.2 ± 2.4		164.7 ± 7.6		0.60
Chi-03-016	0.0264 ± 0.001		0.1770 ± 0.0102		168.3 ± 4.3		165.4 ± 9.5		0.34
Chi-03-017	0.3345 ± 0.008		5.2082 ± 0.1524		1860.4 ± 43.9		1853.9 ± 54.2		0.37
Chi-03-018	0.3131 ± 0.007		5.1170 ± 0.1545		1756.1 ± 41.7		1838.9 ± 55.5		1.08
Chi-03-019	0.0271 ± 0.001		0.1840 ± 0.0075		172.4 ± 4.2		171.5 ± 7.0		0.39
Chi-03-020	0.0271 ± 0.001		0.1862 ± 0.0089		172.3 ± 4.3		173.3 ± 8.3		0.40
Chi-03-021	0.0253 ± 0.001		0.1712 ± 0.0083		161.0 ± 4.0		160.5 ± 7.7		0.47
Chi-03-022	0.3288 ± 0.008		5.2118 ± 0.1525		1832.5 ± 43.3		1854.5 ± 54.3		0.26
Chi-03-023	0.3300 ± 0.008		5.1288 ± 0.1447		1838.5 ± 43.2		1840.8 ± 51.9		0.29
Chi-03-024	0.3275 ± 0.006		5.1393 ± 0.1322		1826.4 ± 34.4		1842.6 ± 47.4		0.30
Chi-03-026	0.3341 ± 0.006		5.2302 ± 0.1369		1858.5 ± 35.6		1857.5 ± 48.6		0.12
Chi-03-027	0.4252 ± 0.005		9.5967 ± 0.1649		2283.9 ± 29.1		2396.8 ± 41.2		0.79
Chi-03-028	0.0267 ± 0.000		0.1758 ± 0.0078		169.8 ± 2.6		164.4 ± 7.3		0.38
Chi-03-029	0.0285 ± 0.000		0.2154 ± 0.0108		181.2 ± 3.0		198.0 ± 9.9		0.44
Chi-03-030	0.0264 ± 0.000		0.1768 ± 0.0088		167.8 ± 2.7		165.3 ± 8.2		0.42
Chi-03-031	0.0362 ± 0.001		0.2404 ± 0.0107		229.3 ± 3.5		218.8 ± 9.7		0.34
Chi-03-032	0.0252 ± 0.000		0.1906 ± 0.0086		160.6 ± 2.5		177.2 ± 8.0		0.50
Chi-03-033	0.2949 ± 0.004		4.5699 ± 0.0791		1665.8 ± 21.1		1743.7 ± 30.2		0.15
Chi-03-034	0.3832 ± 0.005		6.9635 ± 0.1175		2091.1 ± 27.0		2106.7 ± 35.6		0.35
Chi-03-035	0.0266 ± 0.000		0.2129 ± 0.0120		169.4 ± 3.0		195.9 ± 11.0		0.73
Chi-03-036	0.4478 ± 0.006		9.8308 ± 0.2171		2385.3 ± 33.2		2419.0 ± 53.4		1.01
Chi-03-037	0.3473 ± 0.005		5.5119 ± 0.0975		1921.6 ± 24.9		1902.4 ± 33.6		0.26
Chi-03-038	0.0271 ± 0.000		0.1789 ± 0.0079		172.6 ± 2.6		167.1 ± 7.4		0.56
Chi-03-039	0.3914 ± 0.005		6.5833 ± 0.1086		2129.5 ± 27.3		2057.0 ± 33.9		0.41
Chi-03-040	0.0269 ± 0.000		0.1834 ± 0.0095		170.9 ± 2.8		171.0 ± 8.8		0.44
Chi-03-041	0.3665 ± 0.007		8.2875 ± 0.2004		2012.7 ± 40.4		2262.9 ± 54.7		0.50
Chi-03-042	0.0303 ± 0.001		0.2683 ± 0.0127		192.2 ± 4.3		241.3 ± 11.4		0.16
Chi-03-043	0.3322 ± 0.007		5.2985 ± 0.1281		1848.8 ± 36.9		1868.6 ± 45.2		0.17
Chi-03-044	0.0268 ± 0.001		0.1851 ± 0.0097		170.4 ± 3.8		172.4 ± 9.0		0.38
Chi-03-045	0.3332 ± 0.007		5.2144 ± 0.1272		1854.1 ± 37.1		1854.9 ± 45.2		0.36
Chi-03-046	0.0468 ± 0.001		0.3434 ± 0.0127		294.7 ± 6.1		299.7 ± 11.1		0.83
Chi-03-047	0.3333 ± 0.007		5.3457 ± 0.1278		1854.5 ± 37.0		1876.1 ± 44.8		0.36
Chi-03-048	0.3417 ± 0.007		5.5055 ± 0.1321		1894.9 ± 37.8		1901.4 ± 45.6		0.24
Chi-03-049	0.4369 ± 0.006		9.2401 ± 0.1652		2336.7 ± 31.8		2362.0 ± 42.2		0.27
Chi-03-050	0.3464 ± 0.005		5.9264 ± 0.1315		1917.3 ± 27.3		1965.0 ± 43.6		0.52
Chi-03-051	0.2816 ± 0.004		4.2504 ± 0.0960		1599.5 ± 22.7		1683.8 ± 38.0		0.68

Grain No.	Isotopic ratios		Age (Ma)				Th/U		
	<sup>206</sup> Pb/ <sup>238</sup> U	Error 1σ	<sup>207</sup> Pb/ <sup>235</sup> U	Error 1σ	<sup>206</sup> Pb/ <sup>238</sup> U	Error 1σ		<sup>207</sup> Pb/ <sup>235</sup> U	Error 1σ
Chi-03-052	0.3371 ± 0.005		5.2093 ± 0.1031		1872.7 ± 25.9		1854.1 ± 36.7		0.19
Chi-03-053	0.0304 ± 0.001		0.2175 ± 0.0003		193.3 ± 3.8		199.8 ± 14.1		0.36
Chi-03-054	0.5312 ± 0.007		13.4344 ± 0.0036		2746.4 ± 37.7		2710.6 ± 49.6		0.54
Chi-03-055	0.0288 ± 0.000		0.2154 ± 0.0002		183.2 ± 2.9		198.0 ± 8.1		0.39
Chi-03-056	0.0251 ± 0.001		0.1819 ± 0.0003		159.9 ± 4.2		169.7 ± 9.3		0.39
Chi-03-057	0.0262 ± 0.001		0.1868 ± 0.0003		166.8 ± 4.3		173.9 ± 9.0		0.37
Chi-03-058	0.2889 ± 0.007		4.4070 ± 0.0035		1636.0 ± 39.6		1713.6 ± 50.8		0.29
Chi-03-059	0.3336 ± 0.008		5.2158 ± 0.0040		1856.0 ± 44.6		1855.1 ± 51.9		0.40
Chi-03-060	0.3295 ± 0.008		5.1854 ± 0.0040		1835.9 ± 44.1		1850.2 ± 51.8		0.48
Chi-03-061	0.0288 ± 0.001		0.1993 ± 0.0004		183.0 ± 4.8		184.5 ± 10.5		0.42
Chi-03-062	0.0275 ± 0.001		0.1859 ± 0.0004		175.2 ± 4.6		173.1 ± 10.4		0.36
Chi-03-063	0.0280 ± 0.001		0.1971 ± 0.0004		177.7 ± 4.5		182.7 ± 8.9		0.71
Chi-03-064	0.0261 ± 0.000		0.1777 ± 0.0002		166.4 ± 2.8		166.1 ± 8.5		0.35
Chi-03-065	0.3419 ± 0.005		5.5026 ± 0.0023		1896.0 ± 25.9		1900.9 ± 37.6		0.11
Chi-03-066	0.3747 ± 0.005		6.9339 ± 0.0025		2051.5 ± 27.8		2102.9 ± 39.5		0.29
Chi-03-067	0.4021 ± 0.006		7.8192 ± 0.0028		2178.7 ± 30.2		2210.3 ± 45.6		0.69
Chi-03-068	0.3318 ± 0.005		5.1988 ± 0.0023		1847.3 ± 26.0		1852.4 ± 41.8		0.34
Chi-03-069	0.3314 ± 0.005		5.1241 ± 0.0023		1845.0 ± 25.3		1840.0 ± 37.4		0.65
Chi-03-070	0.1218 ± 0.002		1.0863 ± 0.0010		741.2 ± 12.1		746.7 ± 32.4		0.98
Chi-03-071	0.0259 ± 0.001		0.1877 ± 0.0003		164.8 ± 3.3		174.7 ± 12.6		0.63
Chi-03-072	0.3307 ± 0.004		5.2027 ± 0.0019		1841.9 ± 20.7		1853.0 ± 39.5		0.22
Chi-03-073	0.3423 ± 0.004		5.2676 ± 0.0020		1897.9 ± 22.0		1863.6 ± 42.8		0.24
Chi-03-074	0.3399 ± 0.004		5.2783 ± 0.0019		1886.1 ± 21.0		1865.3 ± 39.2		0.28
Chi-03-075	0.3605 ± 0.004		5.5400 ± 0.0021		1984.5 ± 23.1		1906.8 ± 44.2		0.23
Chi-03-076	0.2826 ± 0.003		4.3426 ± 0.0016		1604.3 ± 18.6		1701.4 ± 39.1		0.26
Chi-03-077	0.3110 ± 0.004		4.8553 ± 0.0018		1745.5 ± 20.0		1794.5 ± 27.1		0.30
Chi-03-078	0.0277 ± 0.000		0.2100 ± 0.0002		176.2 ± 2.9		193.5 ± 10.7		0.51
Chi-03-079	0.4550 ± 0.005		10.2090 ± 0.0027		2417.6 ± 29.2		2453.8 ± 48.9		0.99
Chi-03-080	0.3400 ± 0.005		5.4516 ± 0.0023		1886.9 ± 25.5		1892.9 ± 53.9		1.11
Chi-03-081	0.0388 ± 0.000		0.2846 ± 0.0002		245.4 ± 2.7		254.3 ± 5.5		0.21
Chi-03-082	0.3181 ± 0.003		5.0698 ± 0.0017		1780.5 ± 18.9		1831.0 ± 26.8		1.07
Chi-03-083	0.0281 ± 0.000		0.2065 ± 0.0002		178.4 ± 2.7		190.6 ± 10.3		0.33
Chi-03-084	0.0271 ± 0.000		0.1972 ± 0.0002		172.1 ± 2.8		182.8 ± 11.0		0.78
Chi-03-085	0.0281 ± 0.000		0.1731 ± 0.0002		178.4 ± 2.9		162.1 ± 10.3		0.58
Chi-03-086	0.3588 ± 0.006		6.7421 ± 0.0032		1976.5 ± 34.8		2078.1 ± 61.3		0.35
Chi-03-087	0.3249 ± 0.003		5.3937 ± 0.0013		1813.6 ± 14.9		1883.8 ± 32.6		0.17
Chi-03-088	0.3447 ± 0.003		5.6914 ± 0.0016		1909.2 ± 18.2		1930.0 ± 36.7		0.12
Chi-03-089	0.0333 ± 0.001		0.2258 ± 0.0006		211.0 ± 7.7		206.7 ± 12.5		0.58
Chi-03-090	0.0272 ± 0.001		0.1984 ± 0.0007		173.2 ± 8.4		183.8 ± 14.1		0.45
Chi-03-091	0.0279 ± 0.001		0.1923 ± 0.0005		177.3 ± 6.9		178.6 ± 11.4		0.54
Chi-03-092	0.0263 ± 0.001		0.1725 ± 0.0007		167.3 ± 9.1		161.6 ± 13.9		0.54
Chi-03-093	0.3370 ± 0.004		5.3029 ± 0.0019		1872.3 ± 21.6		1869.3 ± 40.7		0.30
Chi-03-094	0.3424 ± 0.006		5.4374 ± 0.0030		1898.4 ± 33.0		1890.7 ± 40.1		0.36
Chi-03-095	0.3272 ± 0.006		5.2055 ± 0.0028		1825.0 ± 31.5		1853.4 ± 37.0		0.73
Chi-03-096	0.4459 ± 0.008		9.6623 ± 0.0039		2377.2 ± 41.3		2403.0 ± 49.5		0.27
Chi-03-097	0.3929 ± 0.007		7.1689 ± 0.0035		2136.1 ± 37.6		2132.6 ± 48.0		0.42
Chi-03-098	0.0384 ± 0.001		0.2727 ± 0.0004		243.0 ± 4.5		244.9 ± 9.3		0.35
Chi-03-099	0.0281 ± 0.001		0.1892 ± 0.0003		178.9 ± 3.3		175.9 ± 7.0		0.45
Chi-03-100	0.0264 ± 0.001		0.1927 ± 0.0003		168.0 ± 3.6		178.9 ± 11.4		0.40

## Appendix 5

Grain No.	Isotopic ratios		Age (Ma)		Th/U				
	$^{206}\text{Pb}/^{238}\text{U}$	Error 1 $\sigma$	$^{207}\text{Pb}/^{235}\text{U}$	Error 1 $\sigma$		$^{206}\text{Pb}/^{238}\text{U}$	Error 1 $\sigma$	$^{207}\text{Pb}/^{235}\text{U}$	Error 1 $\sigma$
Chi-03-101	0.0245	± 0.001	0.2005	± 0.0130	156.2	± 3.5	185.6	± 12.1	0.40
Chi-03-102	0.0273	± 0.000	0.2008	± 0.0107	173.4	± 2.4	185.8	± 9.9	0.47
Chi-03-103	0.0266	± 0.000	0.2225	± 0.0104	169.5	± 2.3	204.0	± 9.5	0.57
Chi-03-104	0.0332	± 0.001	0.2370	± 0.0145	210.4	± 3.2	215.9	± 13.2	1.77
Chi-03-105	0.0279	± 0.000	0.2052	± 0.0078	177.3	± 2.0	189.5	± 7.2	0.50
Chi-03-106	0.0254	± 0.000	0.1831	± 0.0099	161.9	± 2.3	170.8	± 9.3	0.50
Chi-03-107	0.6806	± 0.006	27.1663	± 0.4284	3346.5	± 30.4	3389.4	± 53.4	0.44
Chi-03-108	0.2935	± 0.003	4.6548	± 0.0873	1659.2	± 15.5	1759.1	± 33.0	0.60
Chi-03-109	0.3195	± 0.003	5.0569	± 0.0870	1787.1	± 16.2	1828.8	± 31.4	0.15
Chi-03-110	0.0268	± 0.001	0.1847	± 0.0074	170.5	± 4.2	172.1	± 6.9	0.53
Chi-03-111	0.3193	± 0.008	4.9795	± 0.1543	1786.3	± 42.7	1815.8	± 56.3	0.39
Chi-03-112	0.3237	± 0.008	4.9684	± 0.1567	1807.8	± 43.3	1813.9	± 57.2	1.01
Chi-03-113	0.4232	± 0.010	9.0241	± 0.2770	2274.9	± 54.4	2340.4	± 71.8	0.17
Chi-03-114	0.0269	± 0.001	0.1718	± 0.0131	171.4	± 4.8	161.0	± 12.3	0.61
Chi-03-115	0.3316	± 0.008	5.1340	± 0.1619	1845.9	± 44.2	1841.7	± 58.1	0.51
Chi-03-116	0.0346	± 0.001	0.2582	± 0.0111	219.5	± 5.4	233.2	± 10.0	0.51
Chi-03-117	0.0282	± 0.001	0.2117	± 0.0098	179.3	± 4.5	194.9	± 9.1	0.33
Chi-03-118	0.3489	± 0.007	5.4035	± 0.1439	1929.5	± 38.2	1885.3	± 50.2	0.35
Chi-03-119	0.0357	± 0.001	0.2416	± 0.0097	226.3	± 4.7	219.7	± 8.9	0.49
Chi-03-120	0.3318	± 0.007	5.1227	± 0.1355	1847.0	± 36.5	1839.8	± 48.7	0.86
Chi-03-121	0.3603	± 0.007	5.6326	± 0.1517	1983.8	± 39.4	1921.0	± 51.7	0.37
Chi-03-122	0.4664	± 0.009	9.5214	± 0.2528	2467.9	± 49.0	2389.5	± 63.5	0.39
Chi-03-123	0.4412	± 0.009	8.9426	± 0.2434	2356.2	± 47.0	2332.1	± 63.5	0.44
Chi-03-124	0.0310	± 0.001	0.2786	± 0.0143	197.0	± 4.4	249.5	± 12.8	0.58
Chi-03-125	0.0268	± 0.001	0.2557	± 0.0149	170.3	± 4.0	231.2	± 13.5	0.53
Chi-03-126	0.0292	± 0.000	0.1974	± 0.0065	185.6	± 2.9	182.9	± 6.0	0.38
Chi-03-127	0.0294	± 0.001	0.2004	± 0.0100	186.5	± 3.3	185.4	± 9.3	0.40
Chi-03-128	0.0293	± 0.001	0.2119	± 0.0120	186.0	± 3.5	195.2	± 11.1	0.32
Chi-03-129	0.0270	± 0.001	0.1935	± 0.0122	171.7	± 3.4	179.6	± 11.4	0.41
Chi-03-130	0.0293	± 0.001	0.2014	± 0.0096	186.1	± 3.2	186.3	± 8.9	0.31
Chi-03-131	0.4801	± 0.007	10.7415	± 0.2023	2527.7	± 36.9	2500.9	± 47.1	0.36
Chi-03-132	0.0256	± 0.000	0.1798	± 0.0058	162.9	± 2.5	167.8	± 5.4	0.35
Chi-03-133	0.0284	± 0.001	0.2068	± 0.0115	180.6	± 3.3	190.9	± 10.6	0.42
Chi-03-134	0.0285	± 0.001	0.2112	± 0.0107	180.9	± 4.4	194.6	± 9.9	0.47
Chi-03-135	0.0292	± 0.001	0.2037	± 0.0133	185.5	± 4.8	188.2	± 12.3	0.52
Chi-03-136	0.3522	± 0.008	5.3489	± 0.1776	1945.0	± 44.2	1876.6	± 62.3	0.31
Chi-03-137	0.0379	± 0.001	0.2702	± 0.0128	239.7	± 5.7	242.8	± 11.5	0.76
Chi-03-138	0.3325	± 0.008	5.2114	± 0.1706	1850.3	± 41.9	1854.4	± 60.7	0.25
Chi-03-139	0.0291	± 0.001	0.1802	± 0.0092	185.0	± 4.4	168.2	± 8.6	0.35
Chi-03-140	0.3422	± 0.008	5.2443	± 0.1774	1897.1	± 43.2	1859.8	± 62.9	0.11
Chi-03-141	0.6602	± 0.015	23.0878	± 0.7447	3267.9	± 73.9	3230.5	± 104.2	0.38
Chi-03-142	0.0261	± 0.000	0.1776	± 0.0125	166.4	± 3.0	166.0	± 11.7	0.51
Chi-03-143	0.0291	± 0.000	0.2007	± 0.0082	185.1	± 2.6	185.7	± 7.6	0.54
Chi-03-144	0.3380	± 0.004	5.2583	± 0.0908	1877.3	± 22.2	1862.1	± 32.1	0.38
Chi-03-145	0.3515	± 0.004	5.4282	± 0.0872	1941.7	± 22.6	1889.3	± 30.3	0.24
Chi-03-146	0.0274	± 0.000	0.1729	± 0.0077	174.2	± 2.5	161.9	± 7.2	0.41
Chi-03-147	0.4505	± 0.005	9.7454	± 0.1529	2397.5	± 28.0	2410.9	± 37.8	1.27
Chi-03-148	0.0404	± 0.001	0.2857	± 0.0090	255.2	± 3.3	255.2	± 8.0	0.13