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Supplemental Material

Table S1. Summaries of sample locations and petrographic characteristics of the studied granite dykes from the southern Chinese Altai.

Table S2. LA-ICP-MS U–Pb geochronological analyses of zircon standards.

Table S3. LA-ICP-MS zircon/monazite U–Pb data of the granite dykes from the southern Chinese Altai.

Table S4. LA-ICP-MS monazite U–Pb data of the granite dykes from the southern Chinese Altai.

Table S5. Monazite composition of the studied granite dykes from the southern Chinese Altai.

Table S6. Major and trace element compositions and calculated parameters of the granite dykes from the southern Chinese Altai.

Table S7. Whole-rock Sr and Nd isotope data for granite dykes from the southern Chinese Altai.

TABLE S1. SUMMARIES OF SAMPLE LOCATIONS AND PETROGRAPHIC CHARACTERISTICS OF THE STUDIED GRANITE DYKES FROM THE SOUTHERN CHINESE ALTAI

Sample number	Location	GPS		Lithology	Mineral assemblage
		Long (°E)	Lat (°N)		
<u>Fuyun granite dykes (300~292Ma)</u>					
18CA11	Fuyun	89°23'07.88"	46°59'00.75"	granite porphyry	Phenocryst 30%(Kf+Pl+Bt/Chl+Q, 0.3-1mm) + matrix 70%(quartz-feldspathic)
18CA12	Fuyun	89°23'10.18"	46°58'15.56"	granite porphyry	Phenocryst 40%(Kf+Pl+Bt/Chl+Q, 0.4-0.6mm) + matrix 60%(quartz-feldspathic)
18CA87	Fuyun	89°23'19.47"	47°00'24.24"	granite porphyry	Phenocryst 20%(Kf+Pl+Bt+Ms+Q, 0.5mm) + matrix 80%(quartz-feldspathic+Bt)
18CA88	Fuyun	89°16'54.55"	47°01'53.27"	granite porphyry	Phenocryst 40%(Kf+Pl+Bt+Q, 0.3-0.6mm) + matrix 60%(quartz-feldspathic)
18CA89	Fuyun	89°06'34.74"	47°04'25.79"	granite porphyry	Phenocryst 50%(Kf+Pl+Bt+Q, 0.3-0.6mm) + matrix 50%(quartz-feldspathic)
18CA90	Fuyun	89°16'20.94"	46°58'45.08"	granite porphyry	Phenocryst 30%(Kf+Pl+Bt+Q, 0.5-1mm) + matrix 70%(quartz-feldspathic)
18CA91	Fuyun	89°21'42.93"	46°57'23.41"	granite porphyry	Phenocryst 40%(Kf+Pl+Bt/Chl+Q, 0.4-1mm) + matrix 60%(quartz-feldspathic)
18CA92	Fuyun	89°19'30.08"	47°00'17.15"	granite porphyry	Phenocryst 20%(Kf+Pl+Bt+Q, 0.3-0.5mm) + matrix 80%(quartz-feldspathic+Bt)
<u>Kalasu-Aletai granite dykes (281~265Ma)</u>					
18CA76	Kalasu	88°18'38.55"	47°30'37.17"	Two-mica granite	Kf(25%) + Pl(30%) + Q(35%) + Bt(5%) + Ms(1%)
18CA80	Kalasu	88°22'59.11"	47°28'29.63"	Two-mica granite	Kf(32%) + Pl(30%) + Q(35%) + Bt(3%) + Ms(<1%)
18CA82	Kalasu	88°25'21.99"	47°28'46.46"	Two-mica granite	Kf(30%) + Pl(27%) + Q(40%) + Bt(2%) + Ms(1%)
18CA83-1	Kalasu	88°29'25.20"	47°28'06.07"	Two-mica granite	Kf(35%) + Pl(25%) + Q(35%) + Bt(3%) + Ms(2%)
18CA83-2	Kalasu	88°29'25.20"	47°28'06.07"	Two-mica granite	Kf(35%) + Pl(20%) + Q(30%) + Bt(2%) + Ms(8%) + Grt(2%) + Tur(3%)
18CA84	Kalasu	88°31'02.04"	47°28'28.16"	Muscovite granite	Kf(30%) + Pl(25%) + Q(35-37%) + Ms(5%) + Grt(3-5%)
18CA85	Kalasu	88°31'52.75"	47°32'02.83"	Two-mica granite	Kf(35%) + Pl(23-25%) + Q(35%) + Bt(2%) + Ms(3-5%)
18CA57	Aletai	88°03'25.69"	47°49'56.28"	Two-mica granite	Kf(20%) + Pl(25%) + Q(30%) + Bt(5%) + Ms(20%)
18CA59	Aletai	88°04'59.73"	47°48'14.31"	Two-mica granite	Kf(35%) + Pl(25%) + Q(35%) + Bt(2%) + Ms(3%)
18CA63	Aletai	88°03'39.06"	47°49'58.38"	Muscovite granite	Kf(25%) + Pl(20%) + Q(40%) + Ms(10%) + Grt(2%) + Tur(3%)
18CA66	Aletai	88°04'31.43"	47°48'57.88"	Muscovite granite	Kf(35%) + Pl(25%) + Q(30%) + Ms(8%) + Grt(2%)
18CA67	Aletai	87°33'36.30"	47°55'44.27"	Two-mica granite	Kf(25%) + Pl(35%) + Q(30%) + Bt(2%) + Ms(7%) + Grt(1%)
18CA73	Aletai	88°05'25.59"	47°47'47.60"	Two-mica granite	Kf(40%) + Pl(20-23%) + Q(30%) + Bt(5%) + Ms(2%)

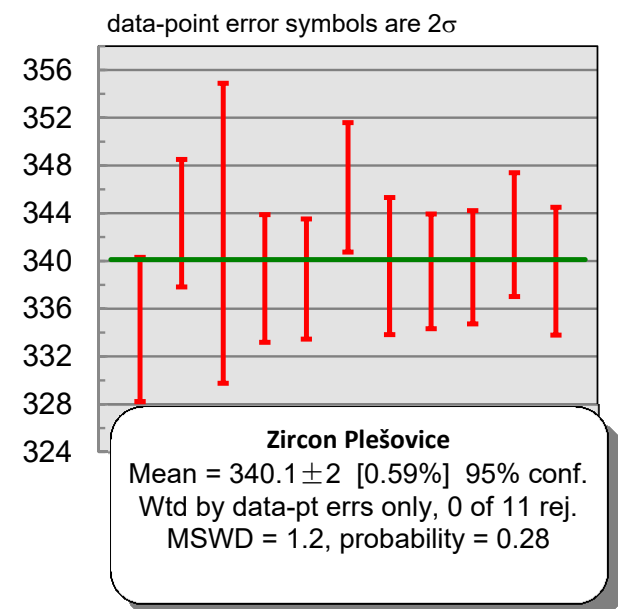
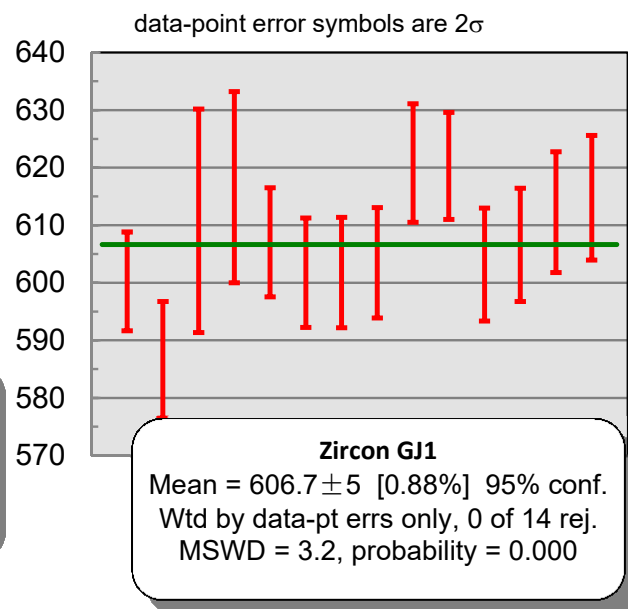
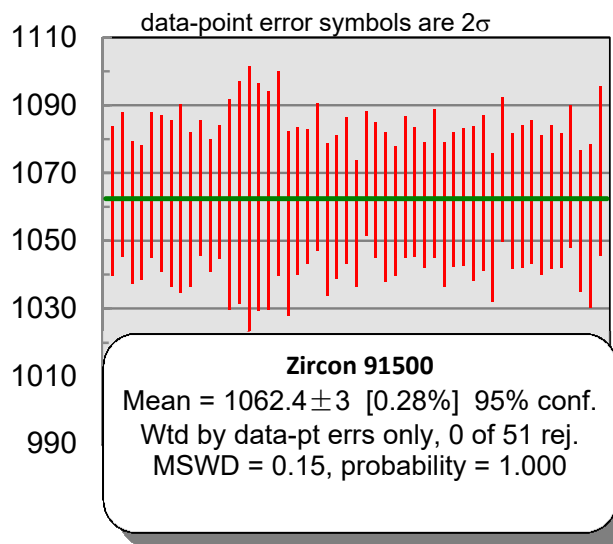
Note: Mineral abbreviations: Pl-plagioclase; Kf-K-feldspar; Q-quartz; Bt-biotite; Ms-muscovite; Tur-tourmaline; Grt-garnet

TABLE S2. LA-ICP-MS U-PB GEOCHRONOLOGICAL ANALYSES OF ZIRCON STANDARDS

Analytical No.	Total	Th/U	Th (ppm)	U (ppm)	Isotope ratios						Age(Ma)					
	Pb (ppm)				²⁰⁷ Pb/ ²⁰⁶ Pb	2σ	²⁰⁷ Pb/ ²³⁵ U	2σ	²⁰⁶ Pb/ ²³⁸ U	2σ	²⁰⁷ Pb/ ²⁰⁶ Pb	2σ	²⁰⁷ Pb/ ²³⁵ U	2σ	²⁰⁶ Pb/ ²³⁸ U	2σ
91500-01	100.5	0.36	84.4	232	0.0749	0.0052	1.8519	0.1292	0.1791	0.0040	1066	150	1064	46	1062	22
91500-02	92.8	0.36	87.7	240	0.0741	0.0053	1.8346	0.1216	0.1799	0.0039	1043	153	1058	44	1066	21
91500-03	78.1	0.36	83.6	233	0.0757	0.0051	1.8658	0.1229	0.1784	0.0039	1087	136	1069	44	1058	21
91500-04	82.5	0.36	89.1	247	0.0753	0.0053	1.8589	0.1357	0.1784	0.0036	1076	141	1067	48	1058	20
91500-05	101.6	0.37	90.2	246	0.0745	0.0054	1.8415	0.1321	0.1799	0.0039	1054	137	1060	47	1066	21
91500-06	99.1	0.36	89.0	247	0.0748	0.0042	1.8575	0.1040	0.1794	0.0042	1065	115	1066	37	1064	23
91500-07	80.3	0.36	86.3	238	0.0750	0.0048	1.8429	0.1115	0.1789	0.0045	1133	120	1061	40	1061	25
91500-08	90.5	0.36	89.7	247	0.0749	0.0058	1.8502	0.1397	0.1792	0.0051	1065	158	1064	50	1062	28
91500-09	90.7	0.36	87.6	241	0.0755	0.0045	1.8585	0.1094	0.1786	0.0042	1083	118	1066	39	1059	23
91500-10	107.1	0.36	86.6	238	0.0743	0.0047	1.8419	0.1142	0.1797	0.0037	1050	139	1061	41	1066	20
91500-11	98.2	0.36	90.1	248	0.0752	0.0042	1.8556	0.1065	0.1788	0.0036	1073	112	1065	38	1060	20
91500-12	82.4	0.36	88.0	243	0.0746	0.0049	1.8448	0.1179	0.1795	0.0036	1057	131	1062	42	1064	20
91500-13	87.0	0.47	120	256	0.0743	0.0049	1.8341	0.1216	0.1788	0.0057	1050	133	1058	44	1061	31
91500-14	87.4	0.46	117	255	0.0755	0.0049	1.8663	0.1208	0.1795	0.0060	1083	130	1069	43	1064	33
91500-15	87.1	0.46	117	254	0.0749	0.0054	1.8502	0.1320	0.1792	0.0072	1065	146	1064	47	1062	39
91500-16	85.6	0.46	118	254	0.0752	0.0049	1.8562	0.1139	0.1793	0.0061	1072	131	1066	41	1063	34
91500-17	87.1	0.47	119	255	0.0746	0.0048	1.8442	0.1125	0.1791	0.0059	1057	131	1061	40	1062	32
91500-18	84.5	0.47	117	250	0.0751	0.0053	1.8772	0.1374	0.1805	0.0055	1072	131	1073	49	1070	30
91500-19	86.2	0.47	119	254	0.0746	0.0054	1.8232	0.1235	0.1778	0.0050	1058	145	1054	44	1055	27
91500-20	116.3	0.49	150	310	0.0751	0.0041	1.8528	0.1011	0.1791	0.0040	1072	111	1064	36	1062	22
91500-21	115.5	0.48	146	306	0.0747	0.0041	1.8476	0.1010	0.1793	0.0036	1061	109	1063	36	1063	20
91500-22	116.4	0.48	147	307	0.0737	0.0042	1.8356	0.1045	0.1803	0.0040	1033	124	1058	37	1069	22
91500-23	116.2	0.48	150	312	0.0761	0.0042	1.8648	0.0989	0.1780	0.0041	1098	107	1069	35	1056	23
91500-24	111.5	0.48	145	303	0.0741	0.0040	1.8247	0.0948	0.1787	0.0039	1056	110	1054	34	1060	21
91500-25	113.3	0.48	147	305	0.0756	0.0041	1.8757	0.1005	0.1796	0.0040	1087	107	1073	36	1065	22
91500-26	115.6	0.48	148	308	0.0748	0.0045	1.8337	0.1082	0.1778	0.0034	1065	113	1058	39	1055	19
91500-27	116.5	0.48	147	309	0.0749	0.0045	1.8667	0.1115	0.1805	0.0034	1133	122	1069	40	1070	18
91500-28	114.2	0.47	144	304	0.0735	0.0042	1.8239	0.1025	0.1796	0.0037	1028	116	1054	37	1065	20

91500-29	127.2	0.48	164	342	0.0762	0.0043	1.8765	0.0992	0.1787	0.0040	1102	111	1073	35	1060	22
91500-30	113.7	0.48	146	304	0.0757	0.0043	1.8675	0.1033	0.1785	0.0035	1087	115	1070	37	1059	19
91500-31	115.2	0.48	146	307	0.0741	0.0045	1.8329	0.1026	0.1798	0.0038	1044	122	1057	37	1066	21
91500-32	114.9	0.48	146	305	0.0746	0.0046	1.8506	0.1150	0.1795	0.0035	1057	126	1064	41	1064	19
91500-33	113.9	0.48	147	306	0.0751	0.0046	1.8498	0.1125	0.1788	0.0034	1072	124	1063	40	1061	18
91500-34	115.2	0.48	146	304	0.0742	0.0038	1.8399	0.0923	0.1800	0.0040	1056	102	1060	33	1067	22
91500-35	116.0	0.48	148	308	0.0756	0.0036	1.8605	0.0900	0.1783	0.0039	1085	96	1067	32	1058	21
91500-36	116.8	0.49	149	306	0.0748	0.0045	1.8529	0.1056	0.1791	0.0036	1063	110	1064	38	1062	20
91500-37	115.7	0.48	146	301	0.0750	0.0048	1.8475	0.1072	0.1792	0.0037	1133	120	1063	38	1063	20
91500-38	23.8	0.35	24.3	70.5	0.0753	0.0059	1.8581	0.1418	0.1789	0.0042	1077	159	1066	50	1061	23
91500-39	25.1	0.34	24.6	71.9	0.0744	0.0053	1.8423	0.1263	0.1794	0.0042	1054	135	1061	45	1064	23
91500-40	24.9	0.34	25.7	74.6	0.0766	0.0055	1.8761	0.1355	0.1776	0.0040	1110	144	1073	48	1054	22
91500-41	26.0	0.34	25.3	74.1	0.0732	0.0059	1.8243	0.1477	0.1807	0.0039	1020	98	1054	53	1071	21
91500-42	27.1	0.35	27.2	78.2	0.0747	0.0049	1.8457	0.1185	0.1790	0.0037	1061	133	1062	42	1062	20
91500-43	26.6	0.35	27.2	78.3	0.0750	0.0053	1.8547	0.1292	0.1793	0.0038	1133	141	1065	46	1063	21
91500-44	27.5	0.35	27.5	77.9	0.0754	0.0054	1.8645	0.1262	0.1795	0.0039	1080	144	1069	45	1064	21
91500-45	29.4	0.36	29.0	81.6	0.0744	0.0051	1.8359	0.1191	0.1788	0.0038	1051	137	1058	43	1061	21
91500-46	27.9	0.36	28.6	78.9	0.0749	0.0048	1.8508	0.1206	0.1793	0.0039	1066	118	1064	43	1063	21
91500-47	27.5	0.36	28.4	78.9	0.0748	0.0048	1.8496	0.1209	0.1791	0.0036	1065	130	1063	43	1062	20
91500-48	27.7	0.36	28.3	79.3	0.0754	0.0055	1.8754	0.1330	0.1804	0.0039	1080	147	1072	47	1069	21
91500-49	27.5	0.36	28.6	79.7	0.0744	0.0054	1.8250	0.1285	0.1780	0.0038	1054	147	1054	46	1056	21
91500-50	28.2	0.36	27.8	77.6	0.0766	0.0054	1.8746	0.1288	0.1777	0.0044	1110	150	1072	46	1054	24
91500-51	26.5	0.35	26.6	75.4	0.0732	0.0054	1.8258	0.1345	0.1807	0.0046	1020	149	1055	48	1071	25
GJ1-01	73.6	0.03	28.9	938	0.0598	0.0032	0.8092	0.0442	0.0976	0.0015	598	115	602	25	600	9
GJ1-02	91.2	0.03	28.9	942	0.0622	0.0031	0.8186	0.0381	0.0953	0.0017	681	117	607	21	587	10
GJ1-03	131.2	0.04	42.9	1085	0.0612	0.0035	0.8348	0.0463	0.0994	0.0033	656	117	616	26	611	19
GJ1-04	112.79	0.04	35.9	918	0.0614	0.0034	0.8507	0.0459	0.1004	0.0028	654	128	625	25	617	17
GJ1-05	154.8	0.04	45.2	1137	0.0588	0.0024	0.8033	0.0339	0.0987	0.0016	567	81	599	19	607	9
GJ1-06	152.9	0.04	44.4	1137	0.0611	0.0026	0.8278	0.0354	0.0978	0.0016	643	89	612	20	602	10
GJ1-07	146.8	0.04	43.0	1091	0.0596	0.0028	0.8101	0.0389	0.0978	0.0016	591	104	603	22	602	10
GJ1-08	148.2	0.04	43.0	1094	0.0590	0.0029	0.8021	0.0381	0.0981	0.0016	569	98	598	21	603	10
GJ1-09	25.57	0.03	9.50	308	0.0575	0.0032	0.8061	0.0463	0.1011	0.0018	522	122	600	26	621	10
GJ1-10	25.46	0.03	9.58	309	0.0568	0.0030	0.7929	0.0414	0.1010	0.0016	483	109	593	23	620	9

GJ1-11	26.74	0.03	9.98	324	0.0606	0.0028	0.8211	0.0377	0.0981	0.0017	633	100	609	21	603	10
GJ1-12	27.00	0.03	10.1	326	0.0598	0.0033	0.8158	0.0442	0.0987	0.0017	596	54	606	25	607	10
GJ1-13	24.59	0.03	9.10	300	0.0597	0.0030	0.8206	0.0409	0.0996	0.0018	591	56	608	23	612	10
GJ1-14	26.31	0.03	9.70	321	0.0582	0.0033	0.8073	0.0448	0.1001	0.0018	539	122	601	25	615	11
Plešovice-01	176.9	0.10	217	2184	0.0560	0.0027	0.4111	0.0191	0.0532	0.0010	454	107	350	14	334	6
Plešovice-02	132.3	0.10	206	2099	0.0556	0.0028	0.4205	0.0210	0.0547	0.0009	435	111	356	15	343	5
Plešovice-03	171.3	0.12	284	2361	0.0569	0.0038	0.4213	0.0252	0.0545	0.0021	487	154	357	18	342	13
Plešovice-04	211.1	0.13	334	2584	0.0549	0.0025	0.4088	0.0185	0.0539	0.0009	406	104	348	13	339	5
Plešovice-05	213.2	0.13	338	2604	0.0535	0.0022	0.3994	0.0164	0.0539	0.0008	350	89	341	12	338	5
Plešovice-06	206.8	0.13	318	2478	0.0507	0.0023	0.3880	0.0173	0.0552	0.0009	228	107	333	13	346	5
Plešovice-07	204.9	0.13	319	2485	0.0525	0.0026	0.3947	0.0195	0.0541	0.0009	309	115	338	14	340	6
Plešovice-08	53.0	0.11	98.3	880	0.0531	0.0024	0.3966	0.0178	0.0540	0.0008	332	109	339	13	339	5
Plešovice-09	53.5	0.11	98.7	908	0.0534	0.0025	0.3994	0.0188	0.0541	0.0008	346	98	341	14	339	5
Plešovice-10	55.9	0.11	106	938	0.0520	0.0025	0.3930	0.0190	0.0545	0.0008	287	111	337	14	342	5
Plešovice-11	57.9	0.11	109	960	0.0536	0.0027	0.4005	0.0201	0.0540	0.0009	354	115	342	15	339	5



SUPPLEMENTARY TABLE S1. LA-ICP-MS U–PB GEOCHRONOLOGICAL ANALYSES OF MONAZITE STANDARDS

Analytical No.	Total Pb (ppm)	Th/U	Th (ppm)	U (ppm)	Isotope ratios						Age(Ma)					
					²⁰⁷ Pb/ ²⁰⁶ Pb	2σ	²⁰⁷ Pb/ ²³⁵ U	2σ	²⁰⁶ Pb/ ²³⁸ U	2σ	²⁰⁷ Pb/ ²⁰⁶ Pb	2σ	²⁰⁷ Pb/ ²³⁵ U	2σ	²⁰⁶ Pb/ ²³⁸ U	2σ
44069-01	633	9	25388	2760	0.0573	0.0028	0.5265	0.0260	0.0666	0.0012	506	117	429	17	415	7
44069-02	652	9	25560	2717	0.0533	0.0027	0.5124	0.0265	0.0697	0.0012	343	115	420	18	434	7
44069-03	831	12	36047	2977	0.0545	0.0025	0.5107	0.0243	0.0680	0.0012	391	104	419	16	424	7
44069-04	764	8	30014	3566	0.0562	0.0024	0.5282	0.0239	0.0682	0.0013	457	96	431	16	425	8
44069-05	1018	9	40124	4389	0.0554	0.0023	0.5223	0.0196	0.0685	0.0012	428	83	427	13	427	7
44069-06	925	6	32740	5086	0.0553	0.0023	0.5167	0.0207	0.0678	0.0014	433	102	423	14	423	9
44069-07	741	15	33202	2212	0.0573	0.0034	0.5388	0.0329	0.0682	0.0015	502	133	438	22	425	9
44069-08	914	7	32170	4701	0.0533	0.0027	0.5002	0.0250	0.0680	0.0012	343	111	412	17	424	7
44069-09	778	11	32257	2854	0.0543	0.0030	0.5082	0.0285	0.0678	0.0013	383	122	417	19	423	8
44069-10	765	9	29039	3374	0.0563	0.0027	0.5308	0.0261	0.0684	0.0012	465	111	432	17	426	8
44069-11	688	8	26521	3136	0.0549	0.0028	0.5126	0.0255	0.0677	0.0013	409	111	420	17	423	8
44069-12	567	9	22285	2410	0.0557	0.0030	0.5264	0.0285	0.0685	0.0013	439	109	429	19	427	8
44069-13	603	9	23910	2659	0.0545	0.0029	0.5126	0.0275	0.0681	0.0012	394	122	420	18	425	8
44069-14	861	8	32355	4124	0.0561	0.0027	0.5264	0.0239	0.0681	0.0012	457	43	429	16	425	7
44069-15	746	10	31029	3013	0.0554	0.0027	0.5199	0.0263	0.0680	0.0021	428	107	425	18	424	13
44069-16	606	9	24478	2673	0.0552	0.0029	0.5191	0.0271	0.0682	0.0016	420	115	425	18	425	10
44069-17	928	14	41130	3037	0.0550	0.0025	0.5159	0.0227	0.0680	0.0012	413	100	422	15	424	7
44069-18	628	10	24634	2537	0.0557	0.0030	0.5231	0.0275	0.0682	0.0013	439	109	427	18	425	8
44069-19	544	8	20624	2536	0.0554	0.0032	0.5215	0.0279	0.0682	0.0015	428	139	426	19	425	9
44069-20	534	8	20445	2467	0.0552	0.0033	0.5175	0.0275	0.0680	0.0016	420	133	423	18	424	10
44069-21	594	8	22908	2914	0.0536	0.0028	0.5047	0.0257	0.0682	0.0014	354	119	415	17	426	8
44069-22	653	8	24899	3183	0.0570	0.0025	0.5342	0.0220	0.0680	0.0015	500	96	435	15	424	9
44069-23	588	9	23026	2476	0.0548	0.0031	0.5164	0.0272	0.0682	0.0018	406	126	423	18	425	11
44069-24	818	8	30675	3827	0.0558	0.0029	0.5226	0.0270	0.0681	0.0030	456	115	427	18	424	18
44069-25	529	8	20596	2521	0.0550	0.0029	0.5161	0.0271	0.0680	0.0014	413	128	423	18	424	9
44069-26	708	8	27363	3221	0.0557	0.0028	0.5229	0.0253	0.0682	0.0014	439	111	427	17	425	9
44069-27	636	12	27104	2331	0.0553	0.0029	0.5178	0.0265	0.0680	0.0014	433	119	424	18	424	9
44069-28	985	10	40123	4018	0.0553	0.0025	0.5212	0.0243	0.0682	0.0012	433	104	426	16	425	7

44069-29	759	8	28789	3423	0.0553	0.0027	0.5160	0.0243	0.0677	0.0013	433	107	422	16	422	8
44069-30	1201	9	45279	5246	0.0554	0.0024	0.5230	0.0218	0.0685	0.0013	428	87	427	15	427	8
44069-31	718	9	27912	3198	0.0554	0.0024	0.5171	0.0214	0.0677	0.0014	428	87	423	14	422	9
44069-32	1142	9	43135	5033	0.0552	0.0022	0.5219	0.0198	0.0685	0.0015	433	89	426	13	427	9
44069-33	775	8	28275	3696	0.0555	0.0026	0.5166	0.0244	0.0675	0.0013	432	94	423	16	421	8
44069-34	565	11	22563	2129	0.0552	0.0034	0.5223	0.0321	0.0687	0.0014	417	137	427	21	428	9
44069-35	656	10	26000	2735	0.0551	0.0027	0.5225	0.0263	0.0689	0.0016	413	111	427	18	429	9
44069-36	1102	9	43474	4667	0.0556	0.0026	0.5165	0.0250	0.0673	0.0013	435	104	423	17	420	8
44069-37	920	7	34087	4614	0.0556	0.0022	0.5222	0.0200	0.0681	0.0013	439	85	427	13	425	8
44069-38	962	7	35699	4882	0.0550	0.0021	0.5167	0.0194	0.0681	0.0013	413	85	423	13	425	8
Trebilcock-01	1719	27	133623	5002	0.0526	0.0024	0.3148	0.0139	0.0435	0.0006	309	104	278	11	275	4
Trebilcock-02	1727	27	134169	5047	0.0542	0.0028	0.3256	0.0164	0.0437	0.0007	376	115	286	13	276	4
Trebilcock-03	1786	26	135227	5139	0.0524	0.0023	0.3139	0.0134	0.0434	0.0008	302	100	277	10	274	5
Trebilcock-04	1777	27	136830	5103	0.0513	0.0025	0.3106	0.0155	0.0437	0.0007	254	111	275	12	276	4
Trebilcock-05	1783	27	136399	5140	0.0516	0.0025	0.3114	0.0146	0.0437	0.0007	333	107	275	11	275	5
Trebilcock-06	1787	27	141595	5250	0.0524	0.0026	0.3105	0.0143	0.0430	0.0007	302	111	275	11	272	4
Trebilcock-07	1882	27	144128	5410	0.0517	0.0022	0.3089	0.0122	0.0434	0.0008	276	91	273	9	274	5
Trebilcock-08	1871	26	143338	5432	0.0505	0.0024	0.3020	0.0140	0.0433	0.0007	217	111	268	11	273	4

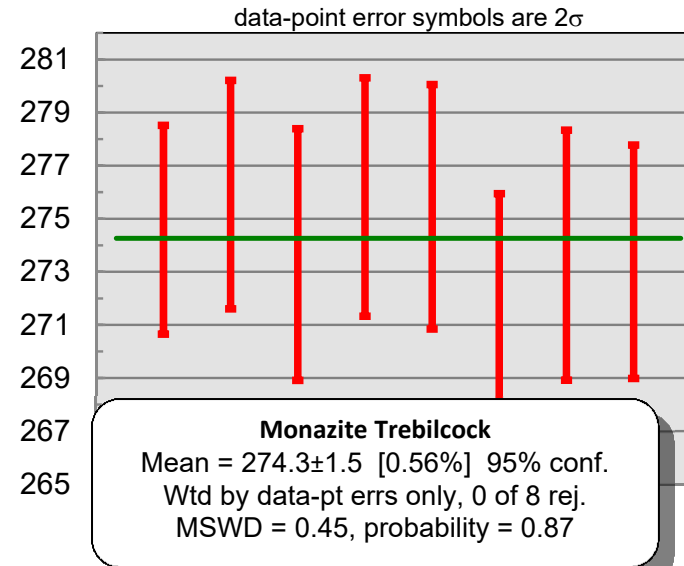
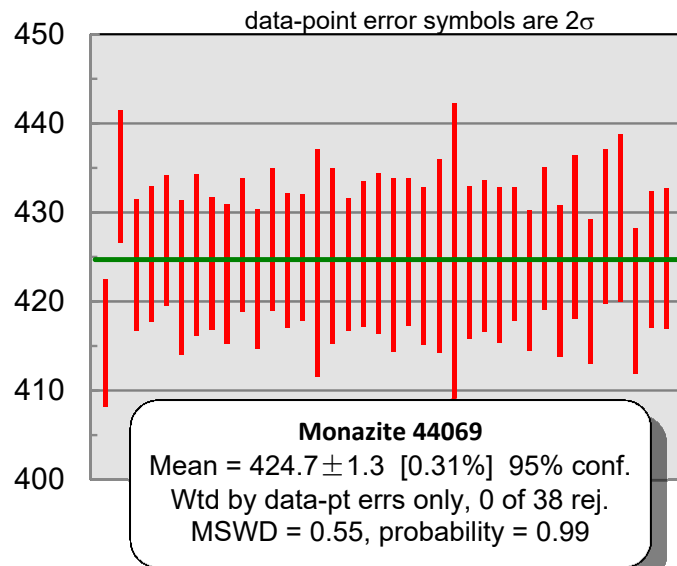


TABLE S3. LA-ICPMS ZIRCON U–PB DATA OF THE GRANITE DYKES FROM THE SOUTHERN CHINESE ALTAI

Analytical No.	Total	Th/U	Th (ppm)	U (ppm)	Isotope ratios						Corrected Age(Ma)		Position
	Pb (ppm)				$^{207}\text{Pb}/^{206}\text{Pb}$	2σ	$^{207}\text{Pb}/^{235}\text{U}$	2σ	$^{206}\text{Pb}/^{238}\text{U}$	2σ	$^{206}\text{Pb}/^{238}\text{U}$	2σ	
18CA11@01	1431	0.9	4418	5083	0.0795	0.0039	0.5314	0.0238	0.0484	0.0007	295	5	rim
18CA11@02	1124	0.9	4812	5405	0.0612	0.0029	0.3966	0.0179	0.0469	0.0007	292	4	rim
18CA11@03	1471	1.0	4425	4650	0.0903	0.0071	0.6032	0.0480	0.0483	0.0008	290	6	rim
18CA11@04	547	0.7	2604	3481	0.0564	0.0024	0.3640	0.0166	0.0467	0.0009	292	6	rim
18CA11@05	1347	1.1	5886	5448	0.0695	0.0033	0.4519	0.0252	0.0468	0.0010	289	6	rim
18CA11@06	2028	1.3	9386	7448	0.0629	0.0028	0.4143	0.0187	0.0476	0.0007	296	4	rim
18CA11@07	1184	1.1	6032	5422	0.0549	0.0020	0.3512	0.0137	0.0461	0.0008	290	5	rim
18CA11@08	1463	1.2	6818	5879	0.0603	0.0023	0.3946	0.0174	0.0471	0.0011	294	7	rim
18CA11@09	1512	1.1	7297	6702	0.0529	0.0020	0.3501	0.0134	0.0478	0.0008	301	5	rim
18CA11@10	1002	1.0	4780	4870	0.0568	0.0023	0.3634	0.0140	0.0463	0.0009	290	6	rim
18CA11@11	2016	1.1	7200	6460	0.0795	0.0039	0.5185	0.0279	0.0469	0.0011	285	7	rim
18CA11@12	868	1.0	3513	3591	0.0688	0.0040	0.4516	0.0300	0.0469	0.0012	290	7	rim
18CA11@13	1125	1.0	5896	5669	0.0532	0.0022	0.3413	0.0141	0.0464	0.0008	292	5	rim
18CA11@14	1377	1.2	6514	5375	0.0665	0.0030	0.4310	0.0246	0.0464	0.0011	287	7	rim
18CA11@15	64	0.6	274	427	0.0561	0.0055	0.3520	0.0322	0.0459	0.0011	288	7	rim
18CA11@16	1062	0.9	3843	4224	0.0735	0.0031	0.4914	0.0215	0.0483	0.0008	296	5	rim
18CA11@17	1186	1.0	4481	4584	0.0719	0.0026	0.4781	0.0175	0.0481	0.0007	296	4	rim
18CA11@18	1073	0.9	4746	5257	0.0599	0.0021	0.3877	0.0139	0.0469	0.0007	293	4	rim
18CA11@19	427	1.1	2323	2195	0.0536	0.0028	0.3544	0.0186	0.0475	0.0012	299	7	rim
18CA11@20	71	0.2	6	30	0.5659	0.0406	9.0236	0.6099	0.1170	0.0050	274	48	rim
18CA11@21	150	0.6	693	1104	0.0555	0.0031	0.3667	0.0199	0.0475	0.0008	298	5	rim
18CA11@22	183	0.2	23	117	0.4543	0.0243	6.0084	0.3301	0.0957	0.0031	306	29	rim
18CA11@23	36	0.9	41	45	0.3047	0.0286	2.6275	0.2124	0.0648	0.0032	282	21	rim
18CA11@24	193	0.8	1072	1275	0.0541	0.0029	0.3436	0.0177	0.0458	0.0010	288	6	rim
18CA11@25	264	1.0	1406	1421	0.0551	0.0027	0.3620	0.0169	0.0474	0.0008	297	5	rim
18CA11@26	467	0.8	1100	1419	0.1531	0.0215	1.3489	0.2335	0.0559	0.0028	309	18	rim
18CA11@27	213	0.8	1082	1384	0.0576	0.0029	0.3763	0.0189	0.0471	0.0009	295	6	rim
18CA11@28	157	0.8	793	1041	0.0538	0.0032	0.3558	0.0209	0.0478	0.0010	300	6	rim

18CA11@29	65	1.6	71	44	0.4258	0.0371	4.9131	0.4297	0.0847	0.0043	290	32	rim
18CA11@30	187	0.8	737	959	0.0755	0.0050	0.4998	0.0361	0.0474	0.0011	290	7	rim
18CA11@31	26	0.2	79	432	0.0525	0.0046	0.3393	0.0291	0.0469	0.0011	295	7	rim
18CA11@32	208	0.7	1046	1533	0.0599	0.0037	0.3862	0.0265	0.0462	0.0010	288	7	rim
18CA90@01	459	0.8	1996	2391	0.0610	0.0038	0.4108	0.0233	0.0490	0.0008	305	5	rim
18CA90@02	4297	1.4	4012	2886	0.4797	0.0158	6.0787	0.2242	0.0913	0.0018	295	15	rim
18CA90@03	8778	2.2	7487	3424	0.5999	0.0206	10.2399	0.4118	0.1228	0.0028	290	26	rim
18CA90@04	14509	2.2	7361	3415	0.6685	0.0282	16.9074	0.8942	0.1812	0.0061	338	48	rim
18CA90@05	2256	1.1	2665	2320	0.3493	0.0183	3.6638	0.2435	0.0746	0.0020	310	14	rim
18CA90@06	3911	1.4	5121	3688	0.3920	0.0282	4.6955	0.4851	0.0814	0.0039	313	23	rim
18CA90@07	1602	0.9	2023	2249	0.2865	0.0185	2.8094	0.2803	0.0678	0.0029	312	16	rim
18CA90@08	11464	1.7	4789	2780	0.6796	0.0209	17.9362	0.8485	0.1896	0.0065	338	44	rim
18CA90@09	4908	1.3	3261	2557	0.5217	0.0198	7.8200	0.4636	0.1071	0.0035	313	22	rim
18CA90@10	6886	1.3	4266	3172	0.5810	0.0199	9.3696	0.3382	0.1165	0.0022	291	23	rim
18CA90@11	1020	0.8	1722	2251	0.2041	0.0271	1.8543	0.3038	0.0591	0.0026	307	18	rim
18CA90@12	229	0.6	1026	1589	0.0584	0.0036	0.3813	0.0234	0.0472	0.0008	295	5	rim
18CA90@13	739	0.8	1502	1786	0.2032	0.0264	1.9365	0.3349	0.0604	0.0034	315	21	rim
18CA90@14	522	0.6	923	1435	0.1432	0.0264	1.2470	0.2892	0.0548	0.0023	309	17	rim
18CA90@15	2446	1.0	3001	3053	0.3198	0.0144	3.1854	0.1735	0.0715	0.0015	313	11	rim
18CA90@16	876	0.8	1972	2334	0.1731	0.0225	1.4482	0.2967	0.0541	0.0025	294	16	rim
18CA90@17	245	0.7	955	1419	0.0678	0.0044	0.4600	0.0292	0.0492	0.0009	304	6	rim
18CA90@18	1595	0.9	2393	2743	0.2337	0.0184	2.0287	0.2081	0.0605	0.0018	302	12	rim
18CA90@19	15028	2.4	6920	2848	0.7259	0.0211	22.7065	1.2209	0.2248	0.0098	326	54	rim
18CA90@20	466	0.7	1742	2459	0.0734	0.0045	0.5071	0.0304	0.0499	0.0009	307	6	rim
18CA90@21	8952	2.7	7770	2833	0.6619	0.0187	13.7868	0.4882	0.1498	0.0035	287	31	rim
18CA90@22	389	1.0	665	678	0.2366	0.0149	1.9558	0.1327	0.0588	0.0015	292	10	rim
18CA90@23	87	0.1	5	34	0.5963	0.0412	9.7981	0.6050	0.1207	0.0050	288	41	rim
18CA90@24	190	0.9	970	1096	0.0565	0.0037	0.3833	0.0233	0.0488	0.0010	306	7	rim
18CA90@25	2072	1.3	1147	880	0.5468	0.0368	9.2806	0.8040	0.1165	0.0067	319	39	rim
18CA90@26	415	1.0	1031	1020	0.1663	0.0099	1.2325	0.0722	0.0532	0.0010	292	7	rim
18CA90@27	5200	2.1	2709	1320	0.6397	0.0305	14.6615	1.2006	0.1601	0.0090	331	47	rim
18CA90@28	8	0.6	41	72	0.0553	0.0106	0.3438	0.0535	0.0473	0.0018	297	12	rim
18CA90@29	90	0.6	394	608	0.0572	0.0036	0.3907	0.0237	0.0491	0.0009	308	6	rim

18CA90@30	347	0.9	1121	1201	0.1054	0.0086	0.7599	0.0628	0.0518	0.0009	307	6	rim
18CA90@31	283	0.9	906	1033	0.1130	0.0090	0.8281	0.0805	0.0515	0.0014	302	9	rim
18CA90@32	452	1.0	1090	1130	0.1715	0.0135	1.3422	0.1226	0.0551	0.0016	300	10	rim

TABLE A4 (CONTINUED)

Analytical No.	Total Pb (ppm)	Th/U	Th (ppm)	U (ppm)	Isotope ratios						Age(Ma)						Position
					$^{207}\text{Pb}/^{206}\text{Pb}$	2σ	$^{207}\text{Pb}/^{235}\text{U}$	2σ	$^{206}\text{Pb}/^{238}\text{U}$	2σ	$^{207}\text{Pb}/^{206}\text{Pb}$	2σ	$^{207}\text{Pb}/^{235}\text{U}$	2σ	$^{206}\text{Pb}/^{238}\text{U}$	2σ	
18CA91@1	309	0.9	1631	1812	0.0575	0.0028	0.3726	0.0195	0.0468	0.0011	509	107	322	14	295	7	rim
18CA91@2	28	0.7	89.1	135	0.0579	0.0068	0.5194	0.0580	0.0655	0.0019	528	256	425	39	409	12	rim
18CA91@3	43	0.9	156	180	0.0602	0.0059	0.5541	0.0542	0.0669	0.0020	613	213	448	35	418	12	rim
18CA91@4	36	0.7	135	187	0.0584	0.0056	0.5219	0.0473	0.0650	0.0017	546	217	426	32	406	10	rim
18CA91@5	46	0.8	184	242	0.0566	0.0050	0.5084	0.0434	0.0652	0.0015	476	193	417	29	407	9	rim
18CA91@6	31	0.8	120	158	0.0564	0.0063	0.5121	0.0540	0.0663	0.0018	465	243	420	36	414	11	rim
18CA91@7	71	0.5	264	525	0.0538	0.0029	0.4389	0.0232	0.0590	0.0010	361	122	370	16	369	6	rim
18CA91@8	309	0.9	1739	2030	0.0519	0.0023	0.3300	0.0160	0.0459	0.0010	280	104	290	12	289	6	rim
18CA91@9	123	0.6	657	1029	0.0539	0.0031	0.3368	0.0208	0.0451	0.0009	369	130	295	16	284	6	rim
18CA91@10	684	0.9	3432	3903	0.0527	0.0025	0.3435	0.0164	0.0472	0.0007	317	107	300	12	297	5	rim
18CA91@11	39	0.6	137	220	0.0559	0.0047	0.5090	0.0423	0.0664	0.0016	450	185	418	28	414	9	rim
18CA91@12	80	0.8	316	390	0.0548	0.0041	0.4855	0.0343	0.0644	0.0013	467	161	402	23	402	8	rim
18CA91@13	13	0.7	42.2	58.9	0.0545	0.0093	0.4594	0.0728	0.0618	0.0024	394	389	384	51	386	15	rim
18CA91@14	54	1.0	208	206	0.0556	0.0048	0.5151	0.0430	0.0671	0.0017	439	193	422	29	419	10	rim
18CA91@15	30	0.6	99.1	163	0.0554	0.0049	0.4937	0.0408	0.0652	0.0015	428	200	407	28	407	9	rim
18CA91@16	72	0.7	221	317	0.0617	0.0044	0.5949	0.0444	0.0696	0.0015	665	156	474	28	433	9	rim
18CA91@17	341	0.8	1630	1972	0.0556	0.0023	0.3512	0.0149	0.0457	0.0007	435	93	306	11	288	4	rim
18CA91@18	28	0.9	93.2	109	0.0549	0.0062	0.4941	0.0582	0.0654	0.0017	409	256	408	40	408	10	rim
18CA91@19	254	0.8	1220	1577	0.0513	0.0027	0.3342	0.0186	0.0469	0.0009	254	128	293	14	296	5	rim
18CA91@20	66	0.5	188	350	0.0583	0.0034	0.5474	0.0313	0.0680	0.0013	543	130	443	21	424	8	rim
18CA91@21	248	0.8	1217	1590	0.0539	0.0022	0.3363	0.0148	0.0451	0.0008	369	93	294	11	284	5	rim
18CA91@22	49	0.7	168	247	0.0541	0.0038	0.4786	0.0338	0.0642	0.0011	376	159	397	23	401	7	rim
18CA91@23	61	0.5	252	521	0.0540	0.0032	0.3429	0.0198	0.0461	0.0007	369	137	299	15	291	4	rim
18CA91@24	269	0.8	1335	1620	0.0542	0.0021	0.3396	0.0134	0.0453	0.0006	389	76	297	10	286	4	rim

18CA91@25	261	0.8	1227	1546	0.0527	0.0024	0.3449	0.0156	0.0473	0.0008	322	104	301	12	298	5	rim
18CA91@26	488	1.1	2535	2348	0.0525	0.0020	0.3384	0.0129	0.0465	0.0006	309	89	296	10	293	4	rim
18CA91@27	197	0.6	791	1227	0.0555	0.0025	0.3825	0.0176	0.0499	0.0009	432	91	329	13	314	6	rim
18CA83@01	88	0.3	364	1212	0.0564	0.0033	0.3409	0.0194	0.0437	0.0010	478	65	298	15	275	6	rim
18CA83@02	69	0.5	412	846	0.0517	0.0042	0.2992	0.0238	0.0419	0.0010	272	185	266	19	265	6	rim
18CA83@03	65	0.4	322	790	0.0561	0.0044	0.3390	0.0255	0.0437	0.0009	457	174	296	19	276	6	rim
18CA83@04	182	0.2	555	2514	0.0621	0.0030	0.3881	0.0178	0.0451	0.0010	680	100	333	13	284	6	rim
18CA83@05	50	0.4	228	610	0.0521	0.0071	0.3259	0.0545	0.0441	0.0012	287	315	286	42	278	8	rim
18CA83@07	46	0.6	320	492	0.0520	0.0058	0.3017	0.0322	0.0420	0.0013	287	256	268	25	265	8	rim
18CA83@08	106	0.2	292	1563	0.0515	0.0030	0.3320	0.0195	0.0463	0.0012	261	133	291	15	292	7	rim
18CA83@09	54	0.8	412	506	0.0533	0.0048	0.3212	0.0291	0.0435	0.0011	339	204	283	22	275	7	rim
18CA83@10	79	0.3	350	1081	0.0535	0.0033	0.3144	0.0186	0.0423	0.0009	350	141	278	14	267	5	rim
18CA83@11	835	0.7	3243	4513	0.0706	0.0030	0.7827	0.0388	0.0791	0.0017	944	87	587	22	491	10	core
18CA83@12	70	0.4	339	857	0.0521	0.0034	0.3276	0.0211	0.0452	0.0011	300	148	288	16	285	7	rim
18CA83@13	70	0.7	528	728	0.0516	0.0044	0.3102	0.0267	0.0433	0.0011	333	193	274	21	273	7	rim
18CA83@14	84	0.4	488	1114	0.0590	0.0041	0.3814	0.0257	0.0467	0.0012	569	156	328	19	294	7	rim
18CA83@15	67	0.5	381	784	0.0543	0.0039	0.3370	0.0243	0.0446	0.0009	383	163	295	18	281	6	rim
18CA83@16	51	0.6	319	574	0.0556	0.0038	0.3410	0.0221	0.0445	0.0011	439	156	298	17	281	7	rim
18CA83@17	62	0.5	323	649	0.0613	0.0050	0.3867	0.0302	0.0458	0.0010	650	178	332	22	289	6	rim
18CA83@18	73	0.3	297	1037	0.0525	0.0030	0.3203	0.0181	0.0440	0.0008	306	133	282	14	277	5	rim
18CA83@19	55	0.5	277	539	0.0552	0.0049	0.3436	0.0296	0.0453	0.0010	420	200	300	22	285	6	rim
18CA83@20	121	0.2	373	1570	0.0524	0.0027	0.3251	0.0155	0.0450	0.0008	302	124	286	12	284	5	rim
18CA83@21	106	0.2	329	1406	0.0501	0.0028	0.3175	0.0175	0.0460	0.0009	198	130	280	13	290	5	rim
18CA83@22	73	0.6	389	682	0.0518	0.0038	0.3244	0.0225	0.0455	0.0010	280	172	285	17	287	6	rim
18CA83@23	115	0.2	315	1590	0.0517	0.0028	0.3192	0.0173	0.0447	0.0008	272	122	281	13	282	5	rim
18CA83@24	126	0.3	395	1509	0.0591	0.0041	0.3722	0.0279	0.0452	0.0009	572	161	321	21	285	6	rim
18CA83@25	103	1.3	487	371	0.0602	0.0046	0.6803	0.0508	0.0819	0.0016	609	176	527	31	508	10	core
18CA83@26	1245	0.8	3879	5068	0.0749	0.0030	0.8935	0.0358	0.0861	0.0013	1065	81	648	19	533	8	core
18CA83@27	83	0.7	502	769	0.0538	0.0039	0.3321	0.0219	0.0453	0.0010	365	163	291	17	286	6	rim
18CA83@29	58	0.5	306	605	0.0523	0.0042	0.3361	0.0280	0.0464	0.0009	298	176	294	21	292	6	rim
18CA83@30	84	0.5	431	919	0.0514	0.0036	0.3185	0.0224	0.0449	0.0009	261	163	281	17	283	6	rim

TABLE S4. LA-ICPMS MONAZITE U–PB DATA OF THE GRANITE DYKES FROM THE SOUTHERN CHINESE ALTAI.

Analytical No.	Total Pb (ppm)	Th (ppm)	U (ppm)	Y (ppm)	Th/U	Isotope ratios						Age(Ma)					
						²⁰⁷ Pb/ ²⁰⁶ Pb	2σ	²⁰⁷ Pb/ ²³⁵ U	2σ	²⁰⁶ Pb/ ²³⁸ U	2σ	²⁰⁷ Pb/ ²⁰⁶ Pb	2σ	²⁰⁷ Pb/ ²³⁵ U	2σ	²⁰⁶ Pb/ ²³⁸ U	2σ
18CA59@01	1906	134345	10355	21795	13	0.0533	0.0020	0.3109	0.0119	0.0423	0.0006	343	89	275	9	267	4
18CA59@02	1670	118858	7862	22152	15	0.0513	0.0022	0.3051	0.0126	0.0432	0.0006	257	100	270	10	273	4
18CA59@03	1816	129062	9119	20309	14	0.0517	0.0019	0.3029	0.0115	0.0424	0.0006	276	85	269	9	268	4
18CA59@04	1651	119119	7322	21295	16	0.0520	0.0019	0.3081	0.0116	0.0429	0.0006	283	85	273	9	271	4
18CA59@05	1443	108727	5476	20677	20	0.0518	0.0023	0.3027	0.0132	0.0424	0.0007	280	94	269	10	268	4
18CA59@06	2122	146075	10271	23501	14	0.0510	0.0020	0.3044	0.0117	0.0432	0.0006	243	89	270	9	272	3
18CA59@07	2028	145536	9544	23548	15	0.0521	0.0019	0.3021	0.0104	0.0420	0.0007	287	72	268	8	265	4
18CA59@08	1516	111010	6170	21394	18	0.0501	0.0022	0.2955	0.0125	0.0428	0.0007	211	100	263	10	270	4
18CA59@09	1845	133338	8501	21828	16	0.0509	0.0018	0.2955	0.0109	0.0420	0.0006	235	85	263	9	265	4
18CA59@10	1640	112312	8187	21541	14	0.0494	0.0019	0.2896	0.0111	0.0424	0.0006	169	89	258	9	268	4
18CA59@11	1546	99667	8993	21743	11	0.0521	0.0021	0.3076	0.0124	0.0428	0.0006	300	102	272	10	270	4
18CA59@12	1358	99317	5475	20520	18	0.0510	0.0027	0.2985	0.0159	0.0424	0.0007	243	113	265	12	268	4
18CA59@14	1820	130654	8351	21686	16	0.0498	0.0021	0.2894	0.0127	0.0421	0.0006	183	100	258	10	266	4
18CA59@15	1519	109393	6230	21057	18	0.0505	0.0025	0.2940	0.0144	0.0422	0.0006	220	115	262	11	267	4
18CA59@16	1757	121652	9407	20792	13	0.0542	0.0022	0.3167	0.0140	0.0422	0.0006	389	89	279	11	266	4
18CA59@17	1613	114478	7200	20850	16	0.0510	0.0022	0.2971	0.0128	0.0423	0.0005	239	109	264	10	267	3
18CA59@18	1811	129784	9238	20738	14	0.0514	0.0022	0.2956	0.0126	0.0417	0.0007	261	100	263	10	263	4
18CA59@19	1781	126204	9369	21362	13	0.0509	0.0020	0.2968	0.0117	0.0423	0.0006	235	89	264	9	267	4
18CA59@20	1839	134427	7822	21606	17	0.0498	0.0020	0.2905	0.0117	0.0422	0.0006	187	93	259	9	266	4
18CA59@21	1765	129705	8084	21485	16	0.0514	0.0020	0.2941	0.0110	0.0415	0.0006	261	89	262	9	262	4
18CA59@22	1995	131189	11153	26067	12	0.0505	0.0018	0.3023	0.0111	0.0433	0.0006	217	81	268	9	274	4
18CA59@23	1816	127336	8736	21440	15	0.0520	0.0020	0.3020	0.0118	0.0420	0.0005	287	93	268	9	265	3
18CA59@24	1747	122603	8836	20914	14	0.0504	0.0021	0.2951	0.0119	0.0424	0.0006	217	100	263	9	268	4
18CA59@25	2074	152982	10005	20256	15	0.0517	0.0020	0.2956	0.0115	0.0414	0.0006	272	89	263	9	261	4
18CA59@26	1573	116877	6999	21473	17	0.0507	0.0023	0.2926	0.0128	0.0419	0.0006	233	104	261	10	264	4
18CA59@27	1770	125934	8367	22721	15	0.0518	0.0019	0.3055	0.0116	0.0426	0.0006	276	81	271	9	269	4
18CA59@28	1744	125523	8595	22781	15	0.0498	0.0020	0.2898	0.0121	0.0421	0.0006	183	31	258	10	266	3
18CA59@29	1665	119024	8192	22113	15	0.0527	0.0021	0.3052	0.0118	0.0420	0.0006	322	33	270	9	265	4
18CA59@30	1630	104373	10779	23120	10	0.0514	0.0019	0.3059	0.0112	0.0430	0.0006	261	85	271	9	272	4

18CA84@01	1139	47614	14179	32952	3	0.0517	0.0020	0.3004	0.0110	0.0421	0.0008	276	85	267	9	266	5
18CA84@02	1108	63018	9108	34996	7	0.0499	0.0021	0.2928	0.0123	0.0426	0.0011	191	96	261	10	269	7
18CA84@03	2074	144420	7331	22223	20	0.0514	0.0025	0.3214	0.0156	0.0453	0.0010	257	111	283	12	286	6
18CA84@04	1412	86557	8994	27379	10	0.0524	0.0021	0.3130	0.0122	0.0434	0.0010	302	93	277	9	274	6
18CA84@05	1612	123106	3592	18792	34	0.0516	0.0027	0.3159	0.0161	0.0445	0.0010	333	122	279	12	280	6
18CA84@07	1011	46980	10751	37758	4	0.0511	0.0020	0.3058	0.0123	0.0433	0.0010	243	89	271	10	274	6
18CA84@08	1233	68642	9531	32589	7	0.0520	0.0021	0.3146	0.0122	0.0441	0.0011	283	96	278	9	278	7
18CA84@09	1354	68614	13442	30944	5	0.0505	0.0017	0.3009	0.0100	0.0432	0.0009	220	69	267	8	272	5
18CA84@10	1449	73064	13615	27054	5	0.0509	0.0018	0.3067	0.0112	0.0436	0.0009	235	81	272	9	275	6
18CA84@11	1561	81620	14498	28186	6	0.0523	0.0020	0.3105	0.0117	0.0431	0.0010	298	85	275	9	272	6
18CA84@12	1363	84706	8395	23198	10	0.0513	0.0023	0.3064	0.0137	0.0434	0.0010	254	94	271	11	274	6
18CA84@13	2488	187320	7529	22333	25	0.0530	0.0024	0.3174	0.0141	0.0435	0.0010	328	100	280	11	275	6
18CA84@15	2517	182144	8409	20780	22	0.0503	0.0021	0.3075	0.0126	0.0444	0.0009	209	91	272	10	280	6
18CA84@16	1609	95181	11193	22907	9	0.0525	0.0020	0.3195	0.0126	0.0443	0.0011	306	89	282	10	279	7
18CA84@17	1345	94822	5534	21922	17	0.0524	0.0025	0.3170	0.0146	0.0441	0.0011	302	98	280	11	278	7
18CA84@18	1441	75074	13579	36130	6	0.0521	0.0019	0.3111	0.0113	0.0434	0.0009	300	76	275	9	274	5
18CA84@19	1300	76977	9407	28738	8	0.0522	0.0021	0.3117	0.0137	0.0433	0.0010	295	83	276	11	273	6
18CA84@21	2313	173268	7100	22409	24	0.0537	0.0022	0.3240	0.0124	0.0439	0.0009	367	144	285	10	277	5
18CA84@22	1060	57345	9065	25270	6	0.0526	0.0019	0.3167	0.0123	0.0436	0.0009	322	20	279	10	275	5
18CA84@23	1650	94180	13098	24871	7	0.0514	0.0018	0.3141	0.0118	0.0443	0.0011	261	78	277	9	279	7
18CA84@24	1175	65632	9337	24280	7	0.0523	0.0019	0.3203	0.0122	0.0444	0.0009	302	85	282	9	280	6
18CA66@01	1391	28108	27626	29592	1	0.0510	0.0017	0.2934	0.0095	0.0416	0.0007	239	65	261	7	263	4
18CA66@02	379	15108	5281	30661	3	0.0519	0.0023	0.3031	0.0133	0.0423	0.0007	283	100	269	10	267	5
18CA66@03	694	36962	7153	21360	5	0.0510	0.0021	0.2965	0.0120	0.0421	0.0006	239	96	264	9	266	4
18CA66@04	927	41691	11960	21381	3	0.0514	0.0017	0.2956	0.0097	0.0416	0.0006	261	78	263	8	263	3
18CA66@05	347	14124	4687	30578	3	0.0512	0.0024	0.2994	0.0137	0.0423	0.0006	250	104	266	11	267	4
18CA66@06	784	47399	6656	19995	7	0.0501	0.0021	0.2927	0.0124	0.0423	0.0007	198	106	261	10	267	4
18CA66@07	574	32080	5251	11140	6	0.0513	0.0024	0.2984	0.0138	0.0421	0.0007	254	107	265	11	266	4
18CA66@08	591	27484	7019	31998	4	0.0509	0.0022	0.2960	0.0121	0.0421	0.0006	235	100	263	9	266	4
18CA66@09	697	23677	10552	20494	2	0.0508	0.0018	0.2966	0.0103	0.0421	0.0006	232	81	264	8	266	4
18CA66@10	722	44858	5641	12934	8	0.0509	0.0024	0.2961	0.0136	0.0420	0.0006	235	98	263	11	265	4
18CA66@11	513	31568	3946	20607	8	0.0496	0.0027	0.2840	0.0150	0.0413	0.0007	176	117	254	12	261	4
18CA66@12	857	55947	5535	24171	10	0.0495	0.0024	0.2855	0.0130	0.0415	0.0006	172	111	255	10	262	4

18CA66@13	621	33063	6266	20929	5	0.0514	0.0026	0.2942	0.0137	0.0413	0.0006	261	106	262	11	261	4
18CA66@14	777	41914	7734	25087	5	0.0497	0.0023	0.2909	0.0129	0.0422	0.0006	189	111	259	10	267	4
18CA66@15	920	40266	11350	31241	4	0.0515	0.0019	0.3025	0.0113	0.0423	0.0006	261	85	268	9	267	4
18CA66@16	661	20992	10276	19104	2	0.0500	0.0019	0.2955	0.0107	0.0426	0.0006	198	85	263	8	269	3
18CA66@17	447	13789	7220	27298	2	0.0531	0.0021	0.3089	0.0120	0.0420	0.0006	332	89	273	9	265	4
18CA66@18	804	33378	10770	21083	3	0.0529	0.0021	0.3077	0.0127	0.0419	0.0006	324	89	272	10	265	4
18CA66@19	665	31128	7945	35867	4	0.0519	0.0020	0.3045	0.0116	0.0424	0.0007	283	85	270	9	267	4
18CA66@20	830	42944	9137	27165	5	0.0508	0.0018	0.2906	0.0105	0.0413	0.0006	232	81	259	8	261	4
18CA66@21	536	27551	5599	22409	5	0.0513	0.0021	0.2986	0.0119	0.0421	0.0007	254	87	265	9	266	4
18CA66@22	785	38505	8850	27447	4	0.0517	0.0019	0.2982	0.0108	0.0416	0.0007	272	94	265	8	263	4
18CA66@23	786	20293	13935	17770	1	0.0513	0.0018	0.2968	0.0105	0.0417	0.0007	254	81	264	8	263	5
18CA66@24	925	43495	11078	31410	4	0.0514	0.0019	0.2956	0.0109	0.0414	0.0008	261	85	263	9	261	5
18CA66@25	603	34375	5258	8265	7	0.0500	0.0024	0.2870	0.0136	0.0413	0.0009	198	115	256	11	261	6
18CA66@26	349	8598	6312	30410	1	0.0527	0.0023	0.3028	0.0128	0.0414	0.0008	317	31	269	10	261	5
18CA66@27	469	20132	6174	24804	3	0.0523	0.0024	0.2976	0.0135	0.0410	0.0008	298	94	265	11	259	5
18CA66@28	450	24094	4260	27351	6	0.0511	0.0026	0.2957	0.0137	0.0419	0.0008	256	115	263	11	265	5
18CA66@29	595	30506	6382	21377	5	0.0530	0.0021	0.3069	0.0118	0.0418	0.0006	328	89	272	9	264	4
18CA66@30	260	8578	4038	20251	2	0.0513	0.0024	0.3020	0.0143	0.0425	0.0007	254	107	268	11	268	4

TABLE S5. MONAZITE COMPOSITION OF THE STUDIED GRANITES FROM THE SOUTHERN CHINESE ALTAI

Spot	SiO ₂ (wt.%)	P ₂ O ₅ (wt.%)	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho
18CA59@-01	0.87	25.1	89076	191923	24287	95751	29769	936.98	18761	2286	8460	909
18CA59@-02	0.00	24.8	91711	203157	25741	104597	31348	910.01	19921	2377	8746	961
18CA59@-03	0.33	24.9	92919	198117	24815	99212	30652	927.99	18540	2237	8101	867
18CA59@-04	1.01	24.5	89796	201063	25750	103896	31687	919.04	19783	2358	8547	922
18CA59@-05	0.61	24.4	96694	211831	26469	107080	29469	799.94	18618	2180	8082	902
18CA59@-06	0.65	25.0	80978	183083	23667	96808	31934	999.20	20429	2525	9272	1016
18CA59@-07	0.78	24.9	79599	182161	23907	99004	32837	964.20	20802	2512	9277	1010
18CA59@-08	0.28	24.5	95066	208751	26274	107799	30366	869.77	19436	2274	8413	954
18CA59@-09	1.46	24.4	83199	190259	24888	101665	32494	959.31	20250	2468	8816	946
18CA59@-10	0.52	25.1	93677	205397	25626	101654	30964	928.20	19418	2318	8546	940
18CA59@-11	0.69	25.4	95583	208700	25639	102313	31694	952.83	19788	2383	8680	940
18CA59@-12	1.99	24.5	96269	211563	26309	105746	28986	769.73	18607	2145	7999	908
18CA59@-13	1.37	24.5	92366	198408	25298	102428	32097	936.97	19730	2335	8531	904
18CA59@-14	0.41	24.9	86261	193054	25057	102877	33054	967.52	20574	2428	8787	953
18CA59@-15	0.98	24.7	93432	207738	26013	106129	29966	847.74	19268	2247	8305	942
18CA59@-16	0.26	25.0	97015	204494	25209	97567	27715	1112.43	17972	2152	8136	919
18CA59@-17	0.61	24.8	92773	206239	25897	103272	30924	863.24	19462	2301	8473	909
18CA59@-18	0.88	24.5	92073	198002	24728	97168	30132	902.68	19129	2280	8257	898
18CA59@-19	1.12	24.3	92021	198362	24693	97836	30801	920.02	19379	2361	8563	940
18CA59@-20	1.28	24.1	85976	195024	24797	101165	30515	875.58	19647	2350	8562	946
18CA59@-21	0.70	24.5	88309	195425	25205	102145	31763	922.74	19939	2397	8791	941
18CA59@-22	0.72	25.3	82808	187373	23747	96169	31884	960.33	21315	2705	10092	1136
18CA59@-23	1.09	25.1	89461	194981	24614	98025	30356	903.15	19124	2344	8610	941
18CA59@-24	0.45	25.0	92657	201826	25329	98949	30836	918.26	18833	2279	8266	895
18CA59@-25	0.39	24.4	89534	188745	23429	93993	29582	859.05	18332	2212	7998	871
18CA59@-26	0.95	24.2	91799	204680	25830	104048	31540	871.23	19954	2350	8599	931
18CA59@-27	0.64	25.0	85512	193881	25322	102345	32493	941.36	21136	2527	9210	987
18CA59@-28	0.60	24.5	90622	199814	25212	99393	30622	917.01	19889	2446	9103	988
18CA59@-29	0.82	24.8	89745	201983	25442	101136	31037	942.69	20048	2412	8778	939
18CA59@-30	0.98	25.1	98053	206763	25204	96947	29222	903.31	18879	2377	8886	990
18CA66@01	0.035	23.3	102042	239987	30506	120109	33942	5.98	21221	2506	9578	1118
18CA66@02	0.41	22.6	86283	247367	35354	147709	44656	0.73	25003	2940	10552	1123
18CA66@03	1.03	22.6	107373	253799	32190	127391	32138	2.11	19409	2065	7380	851
18CA66@04	0.23	22.8	115236	250628	30657	120495	30832	3.31	19766	2120	7472	830
18CA66@05	0.65	22.6	88984	249968	35307	152335	38075	0.84	22535	2578	9817	1184
18CA66@06	0.48	22.5	100738	245834	32238	129922	38736	3.96	22536	2345	7718	776
18CA66@07	0.47	22.7	93918	250643	34435	145080	49166	0.58	26571	2092	4884	363
18CA66@08	1.40	21.9	80898	236737	34162	149511	41116	0.51	25741	2925	10722	1216
18CA66@09		22.9	89426	248407	34851	145124	44143	2.27	27340	2774	8185	722
18CA66@10	1.60	21.3	87376	244151	34368	146114	47145	0.87	26920	2235	5626	442
18CA66@11	0.65	22.6	107950	258971	33322	134135	31936	1.20	19633	2003	7140	828
18CA66@12	1.45	22.4	79045	213565	30337	130589	53375	2.24	40808	4006	10281	774
18CA66@13	0.35	22.9	109470	257393	32596	129263	32728	1.89	20026	2094	7350	837
18CA66@14	0.40	23.2	93762	238839	32522	137786	36849	2.56	22551	2348	8370	970
18CA66@15	0.88	21.8	85973	237014	32964	140434	37792	0.87	23072	2662	10062	1208
18CA66@16		22.8	89033	248390	35690	153621	44922	1.03	24264	2385	7285	639

18CA66@17	0.93	22.6	83979	247127	35405	152704	42456	1.59	25595	2836	9844	1052
18CA66@18		23.2	111379	255250	31827	125638	32747	3.86	19596	2116	7379	815
18CA66@19	0.84	21.9	80332	233172	33720	149681	40195	0.64	25409	2975	11623	1432
18CA66@20	0.70	21.5	90839	243223	33313	141409	37103	0.66	21987	2493	9186	1060
18CA66@21	0.84	22.0	87440	248729	35363	154309	40220	0.62	22459	2389	8272	888
18CA66@22	1.57	21.4	90679	242315	33382	142017	35630	1.29	21350	2400	9062	1101
18CA66@23	1.16	22.0	89693	254454	36463	150024	41021	0.88	19744	1991	6406	628
18CA66@24	1.66	21.2	85137	236065	32710	138598	37243	0.99	22884	2671	10257	1227
18CA66@25	0.71	22.5	81235	236391	34682	150601	64049	0.87	34376	2396	4406	252
18CA66@26	0.80	22.5	88784	249966	35167	147338	43728	0.70	25254	2868	10403	1147
18CA66@27	0.56	22.1	92905	257192	35770	148960	37308	0.71	21178	2330	8438	973
18CA66@28	1.13	22.5	85961	243432	34533	150964	40295	0.60	23923	2647	9580	1082
18CA66@29	0.24	22.5	118244	263734	32149	124096	30904	2.06	18398	1994	7312	868
18CA66@30	0.24	22.5	98049	268925	36413	148487	39669	0.96	21957	2310	7645	771
18CA84@01	1.04	18.5	64349	242794	38556	153701	48388	53.8	23363	2835	10589	1083
18CA84@02	0.42	18.4	64251	237953	36153	149385	51038	71.6	25761	3157	11414	1169
18CA84@03	1.19	19.0	71558	198628	28152	116592	52095	150	25095	2666	8766	838
18CA84@04	1.09	18.8	61447	228752	36743	145310	47730	72.8	23387	2668	9456	961
18CA84@05	1.61	17.6	102469	230826	29438	111946	36505	173	20411	2151	7298	734
18CA84@06	1.39	19.4	65209	225967	34507	137183	45063	70.1	25218	3395	13024	1496
18CA84@07	0.58	19.6	61339	232403	39337	155717	51270	79.4	24147	3052	10790	1155
18CA84@08	0.22	20.0	64328	229812	36376	146802	49021	77.8	24115	2915	10598	1114
18CA84@09	0.059	19.7	64021	234172	37611	145518	48950	119	22211	2862	10278	1056
18CA84@10	1.00	19.1	65209	231849	36586	147723	47363	63.6	21729	2554	9380	934
18CA84@11	1.32	19.3	72525	225061	33341	137175	42776	61.9	22935	2722	10113	1122
18CA84@12	0.55	19.9	65194	232589	36378	142348	49425	60.4	22498	2469	8074	732
18CA84@13	1.42	19.4	77515	175706	23635	91898	48897	188	25864	2759	9080	899
18CA84@14	2.08	18.8	84312	199340	26476	105877	41533	152	22226	2382	7988	771
18CA84@15	0.64	19.8	84088	195277	22212	86786	41845	221	23423	2614	8229	846
18CA84@16	1.03	20.0	66206	224761	33672	136617	46508	64.7	22072	2440	8525	827
18CA84@17	1.20	19.8	66361	232083	35756	141234	43271	65.6	20573	2185	7511	794
18CA84@18	0.77	20.5	58004	214300	33921	144433	48960	67.5	25022	3088	11880	1287
18CA84@19	1.24	20.5	62720	222326	35005	143888	46276	63.0	24078	2764	10200	1046
18CA84@20	1.97	19.8	67223	174001	23552	104071	52143	162	25511	2652	8625	874
18CA84@21	1.43	20.1	74480	178942	23490	98334	50218	182	26256	2827	8874	874
18CA84@22	0.59	21.0	60815	238020	36815	155196	49311	88.8	21509	2521	8666	841
18CA84@23	1.42	19.7	65399	222776	33811	143312	39494	62.6	20517	2292	8320	938
18CA84@24	0.88	21.7	69272	229339	36285	142389	47205	82.3	21564	2563	8831	843

TABLE A6 (CONTINUED)

Spot	Er	Tm	Yb	Lu	Hf	Y	Th	U	Eu/Eu*	ΣREE	Th/U	(La/Yb) _N
18CA59@-01	1561	176	854	82.7	0.49	21795	134345	10355	0.1212	464831	13.0	74.8
18CA59@-02	1581	166	767	73.3	0.36	22152	118858	7862	0.1113	492056	15.1	85.8
18CA59@-03	1453	160	799	77.3	0.40	20309	129062	9119	0.1190	478878	14.2	83.5
18CA59@-04	1513	158	737	70.1	0.89	21295	119119	7322	0.1122	487199	16.3	87.4
18CA59@-05	1511	151	685	64.1	0.69	20677	108727	5476	0.1044	504537	19.9	101.3
18CA59@-06	1698	187	909	85.3	0.58	23501	146075	10271	0.1196	453590	14.2	63.9
18CA59@-07	1699	184	898	86.5	0.77	23548	145536	9544	0.1128	454940	15.2	63.6
18CA59@-08	1563	162	741	70.4	0.75	21394	111010	6170	0.1095	502740	18.0	92.0

18CA59@-09	1576	169	808	76.1	0.67	21828	133338	8501	0.1143	468573	15.7	73.9
18CA59@-10	1543	167	771	73.7	0.73	21541	112312	8187	0.1157	492023	13.7	87.1
18CA59@-11	1573	169	823	78.6	0.77	21743	99667	8993	0.1163	499319	11.1	83.3
18CA59@-12	1474	150	688	62.2	0.68	20520	99317	5475	0.1013	501677	18.1	100.4
18CA59@-13	1519	168	827	78.4	0.46	21245	116805	8365	0.1138	485625	14.0	80.1
18CA59@-14	1581	169	786	76.6	0.59	21686	130654	8351	0.1134	476625	15.6	78.7
18CA59@-15	1553	158	736	67.7	0.34	21057	109393	6230	0.1079	497401	17.6	91.1
18CA59@-16	1512	159	747	69.2	0.28	20792	121652	9407	0.1524	484780	12.9	93.2
18CA59@-17	1516	155	737	68.1	0.39	20850	114478	7200	0.1076	493590	15.9	90.3
18CA59@-18	1509	165	818	80.2	0.67	20738	129784	9238	0.1149	476142	14.0	80.7
18CA59@-19	1582	171	843	83.0	0.63	21362	126204	9369	0.1151	478555	13.5	78.3
18CA59@-20	1573	165	800	74.7	0.40	21606	134427	7822	0.1093	472471	17.2	77.0
18CA59@-21	1563	160	758	71.9	0.28	21485	129705	8084	0.1121	478392	16.0	83.5
18CA59@-22	1943	212	1028	98.1	0.46	26067	131189	11153	0.1126	461472	11.8	57.8
18CA59@-23	1582	167	822	76.0	0.55	21440	127336	8736	0.1146	472006	14.6	78.1
18CA59@-24	1514	165	847	79.3	0.37	20914	122603	8836	0.1165	483393	13.9	78.4
18CA59@-25	1477	162	823	77.8	0.99	20256	152982	10005	0.1128	458095	15.3	78.0
18CA59@-26	1568	161	766	71.5	0.65	21473	116877	6999	0.1062	493168	16.7	85.9
18CA59@-27	1659	173	841	78.3	0.77	22721	125934	8367	0.1098	477105	15.1	72.9
18CA59@-28	1659	178	850	82.2	0.40	22781	125523	8595	0.1136	481775	14.6	76.5
18CA59@-29	1578	166	807	74.6	0.59	22113	119024	8192	0.1155	485088	14.5	79.8
18CA59@-30	1725	182	899	86.7	0.71	23120	104373	10779	0.1176	491117	9.7	78.3
18CA66@01	1996	218	1128	112	0.30	29592	28108	27626	0.0007	564468	1.0	64.9
18CA66@02	1948	221	1210	117	0.84	30661	15108	5281	0.0001	604483	2.9	51.2
18CA66@03	1454	149	761	75.1	0.26	21360	36962	7153	0.0003	585037	5.2	101.2
18CA66@04	1362	133	613	58.6	0.63	21381	41691	11960	0.0004	580204	3.5	134.9
18CA66@05	2191	244	1294	131	0.56	30578	14124	4687	0.0001	604643	3.0	49.3
18CA66@06	1196	122	562	47.3	0.74	19995	47399	6656	0.0004	582774	7.1	128.5
18CA66@07	431	31.1	116	9.93	0.13	11140	32080	5251	0.0000	607740	6.1	580.9
18CA66@08	2017	206	1026	90.9	0.74	31998	27484	7019	0.0000	586368	3.9	56.5
18CA66@09	975	83.8	370	29.6	0.24	20494	23677	10552	0.0002	602433	2.2	173.4
18CA66@10	525	38.1	135	10.9	0.25	12934	44858	5641	0.0001	595086	8.0	463.9
18CA66@11	1378	132	603	55.6	0.33	20607	31568	3946	0.0001	598087	8.0	128.4
18CA66@12	857	56.1	180	12.7	0.46	24171	55947	5535	0.0001	563886	10.1	314.4
18CA66@13	1382	139	682	64.4	0.20	20929	33063	6266	0.0002	594026	5.3	115.1
18CA66@14	1583	146	640	58.1	0.38	25087	41914	7734	0.0003	576427	5.4	105.1
18CA66@15	2151	237	1236	119	0.75	31241	40266	11350	0.0001	574924	3.5	49.9
18CA66@16	822	70.0	283	20.5	0.77	19104	20992	10276	0.0001	607424	2.0	225.8
18CA66@17	1615	152	667	55.6	0.77	27298	13789	7220	0.0001	603490	1.9	90.3
18CA66@18	1325	125	576	51.9	0.50	21083	33378	10770	0.0005	588830	3.1	138.6
18CA66@19	2579	280	1382	131	0.89	35867	31128	7945	0.0001	582912	3.9	41.7
18CA66@20	1848	192	955	90.3	0.46	27165	42944	9137	0.0001	583700	4.7	68.2
18CA66@21	1413	133	626	53.0	0.53	22409	27551	5599	0.0001	602296	4.9	100.2
18CA66@22	1946	201	982	96.3	1.02	27447	38505	8850	0.0001	581163	4.4	66.2
18CA66@23	955	92.3	432	38.0	0.18	17770	20293	13935	0.0001	601942	1.5	148.9
18CA66@24	2194	238	1194	115	0.61	31410	43495	11078	0.0001	570533	3.9	51.2
18CA66@25	252	17.3	63.5	5.00	0.35	8265	34375	5258	0.0001	608727	6.5	917.0
18CA66@26	1934	208	1034	98.3	0.67	30410	8598	6312	0.0001	607929	1.4	61.6
18CA66@27	1657	170	854	81.1	0.40	24804	20132	6174	0.0001	607818	3.3	78.0

18CA66@28	1850	186	895	80.7	0.32	27351	24094	4260	0.0001	595427	5.7	68.9
18CA66@29	1506	160	805	77.5	0.57	21377	30506	6382	0.0003	600248	4.8	105.3
18CA66@30	1184	112	517	44.1	0.20	20251	8578	4038	0.0001	626084	2.1	136.0
18CA84@01	1903	244	1345	130	0.58	32952	47614	14179	0.0049	589335	3.4	34.3
18CA84@02	2034	243	1308	125	0.83	34996	63018	9108	0.0060	584065	6.9	35.2
18CA84@03	1354	143	715	62.1	0.80	22223	144420	7331	0.0127	506813	19.7	71.8
18CA84@04	1602	176	895	82.7	0.69	27379	86557	8994	0.0067	559282	9.6	49.3
18CA84@05	1148	119	539	48.3	0.68	18792	123106	3592	0.0194	543806	34.3	136.3
18CA84@06	2818	342	1821	179	1.27	40227	61771	14860	0.0064	556292	4.2	25.7
18CA84@07	2096	272	1530	154	0.85	37758	46980	10751	0.0069	583339	4.4	28.8
18CA84@08	1903	213	1125	104	0.18	32589	68642	9531	0.0069	568504	7.2	41.0
18CA84@09	1801	210	1129	99.3	0.60	30944	68614	13442	0.0111	570038	5.1	40.7
18CA84@10	1603	176	930	84.2	0.52	27054	73064	13615	0.0061	566185	5.4	50.3
18CA84@11	1774	206	948	86.1	0.75	28186	81620	14498	0.0060	550845	5.6	54.8
18CA84@12	1162	136	716	61.2	0.31	23198	84706	8395	0.0055	561844	10.1	65.3
18CA84@13	1420	147	726	64.8	0.50	22333	187320	7529	0.0162	458798	24.9	76.6
18CA84@14	1267	126	633	53.6	0.77	19350	157795	5344	0.0153	493136	29.5	95.5
18CA84@15	1276	128	621	53.4	0.15	20780	182144	8409	0.0216	467618	21.7	97.2
18CA84@16	1343	149	735	67.9	0.50	22907	95181	11193	0.0062	543988	8.5	64.6
18CA84@17	1274	132	657	56.3	0.59	21922	94822	5534	0.0067	551952	17.1	72.4
18CA84@18	2320	274	1538	147	0.60	36130	75074	13579	0.0059	545241	5.5	27.1
18CA84@19	1663	197	991	90.7	0.79	28738	76977	9407	0.0058	551307	8.2	45.4
18CA84@20	1270	129	616	52.2	0.95	20831	178993	7159	0.0136	460880	25.0	78.3
18CA84@21	1363	139	658	57.6	0.74	22409	173268	7100	0.0153	466693	24.4	81.2
18CA84@22	1349	161	805	71.1	0.49	25270	57345	9065	0.0083	576167	6.3	54.2
18CA84@23	1546	167	770	76.2	0.71	24871	94180	13098	0.0067	539483	7.2	60.9
18CA84@24	1328	146	779	66.8	0.87	24280	65632	9337	0.0079	560691	7.0	63.8

TABLE S6. MAJOR AND TRACE ELEMENT COMPOSITIONS AND CALCULATED PARAMETERS OF THE GRANITE DYKES FROM THE SOUTHERN CHINESE ALTAI

Data Sources		Gong et al.(2007)							
Lithology		Granite porphyries							
Sample No.	A8236	A8246	A8246-1	A8246-2	A8262	A8262-2	A9013	A9022	A9024
<u>Major elements (wt.%)</u>									
SiO ₂	75.38	72.67	71.48	72.65	70.90	70.98	72.71	74.08	75.27
TiO ₂	0.10	0.23	0.22	0.18	0.29	0.29	0.21	0.12	0.08
Al ₂ O ₃	13.13	14.37	13.64	13.51	14.53	14.38	13.85	13.35	12.80
Fe ₂ O ₃ T	1.37	2.21	2.19	1.77	2.62	2.65	1.92	1.43	1.15
MnO	0.04	0.05	0.04	0.03	0.05	0.05	0.05	0.05	0.03
MgO	0.27	0.57	0.54	0.50	0.79	0.74	0.54	0.43	0.13
CaO	0.68	1.29	1.79	1.36	1.76	1.96	0.82	0.50	0.33
Na ₂ O	3.51	3.72	3.73	3.63	3.67	3.62	3.94	3.14	4.11
K ₂ O	4.85	3.98	4.31	3.92	4.08	3.98	4.53	5.42	4.88
P ₂ O ₅	0.04	0.09	0.08	0.06	0.11	0.10	0.07	0.04	0.04
LOI	0.47	0.67	1.41	1.56	0.88	0.61	0.85	0.90	0.53
Total	99.84	99.85	99.43	99.17	99.68	99.36	99.49	99.46	99.35
Mg#	28	34	33	36	37	36	36	37	18
ACNK	1.07	1.13	0.97	1.07	1.06	1.04	1.08	1.12	1.01
ANK	1.19	1.38	1.26	1.32	1.39	1.40	1.22	1.21	1.06
K ₂ O/Na ₂ O	1.38	1.07	1.16	1.08	1.11	1.10	1.15	1.73	1.19
<u>Trace elements (ppm)</u>									
Ga	14.9	15.3	14.9	14.6	18.2	18.9	15.7	14.8	12.5
Rb	143	80	101	102	79.8	77.2	125	167	133
Sr	111	263	209	199	287	302	270	206	107
Y	16.4	16.3	16.4	11.3	19.8	19.1	13.4	14.8	11.4
Zr	73.8	149	155	109	189	193	123	102	70.2
Nb	9.48	7.97	6.37	6.85	13.7	11.3	8.43	13.9	9.92
Cs	2.3	1.17	1.36	1.95	0.73	1.11	1.26	1.84	1.08
Ba	337	594	628	637	724	702	759	670	672
La	19	25.5	24.1	21.5	28.3	27.6	23.7	24.3	17.2
Ce	32.8	51.6	49.1	38.4	58.3	57.5	47.1	48.8	28.9
Pr	4	5.44	5.13	4.01	6.4	6.27	4.53	4.39	3.33
Nd	14.9	20.1	19	14	24.5	23.6	16	15.2	11.7
Sm	3.05	3.6	3.52	2.42	4.53	4.41	2.85	2.74	2.12
Eu	0.52	0.95	0.94	0.78	1.1	1.07	0.85	0.73	0.57
Gd	3.14	3.79	3.63	2.6	4.7	4.4	3.04	3.06	2.24
Tb	0.45	0.48	0.47	0.33	0.59	0.57	0.39	0.4	0.3
Dy	2.67	2.79	2.72	1.85	3.41	3.31	2.19	2.34	1.8
Ho	0.54	0.55	0.55	0.37	0.67	0.65	0.44	0.49	0.37
Er	1.73	1.73	1.77	1.19	2.11	2.03	1.45	1.58	1.21
Tm	0.25	0.26	0.26	0.18	0.3	0.3	0.21	0.25	0.19
Yb	1.77	1.8	1.85	1.31	2.16	2.1	1.57	1.74	1.37
Lu	0.27	0.28	0.29	0.22	0.33	0.32	0.25	0.28	0.21
Hf	2.74	4.22	4.4	3.27	5.08	5.14	3.64	3.29	2.4
Ta	0.53	0.4	0.39	0.53	0.45	0.41	0.57	0.74	0.54
Pb	17.2	13.1	12.7	15.6	15	17.2	18.5	14.7	14.6

Th	12.7	6.41	6.81	9.89	7.29	7.2	10.9	11.8	11.7
U	1.95	1.55	1.56	2.58	1.47	1.63	2.21	1.91	3.49
ΣLREE	74.27	107.19	101.79	81.11	123.13	120.45	95.03	96.16	63.82
ΣHREE	10.82	11.68	11.54	8.05	14.27	13.68	9.54	10.14	7.69
Rb/Sr	1.29	0.30	0.48	0.51	0.28	0.26	0.46	0.81	1.24
Rb/Ba	0.42	0.13	0.16	0.16	0.11	0.11	0.16	0.25	0.20
Nb/Ta	17.89	19.93	16.33	12.92	30.44	27.56	14.79	18.78	18.37
Zr/Hf	26.93	35.31	35.23	33.33	37.20	37.55	33.79	31.00	29.25
Y/Ho	30.37	29.64	29.82	30.54	29.55	29.38	30.45	30.20	30.81
10000*Ga/Al	2.14	2.01	2.06	2.04	2.37	2.48	2.14	2.09	1.84
δEu	0.51	0.79	0.80	0.95	0.73	0.74	0.88	0.77	0.80
TE _{1,3}	0.94	0.95	0.95	0.93	0.95	0.96	0.96	0.96	0.92
T _{Zr} (°C)	728	787	775	757	801	800	767	757	719

TABLE A2 (CONTINUED)

Data Sources		Zhang et al.(2012)								
Lithology		Granite porphyries								
Sample No.	08AL	08AL	08AL	08AL	08AL	08AL	08AL	08AL	08AL	08AL
	18-1	18-4	18-5	18-6	18-7	18-8	18-12	18-13	18-14	18-15
<u>Major elements (wt.%)</u>										
SiO ₂	72.83	73.38	73.11	73.39	72.85	72.91	71.24	71.73	73.54	72.62
TiO ₂	0.21	0.19	0.21	0.21	0.21	0.22	0.23	0.23	0.18	0.23
Al ₂ O ₃	14.20	13.91	13.95	13.76	14.24	14.15	14.21	14.13	13.77	14.11
Fe ₂ O ₃ T	1.71	1.63	1.81	1.70	1.72	1.76	1.86	1.91	1.58	1.86
MnO	0.04	0.04	0.05	0.04	0.03	0.03	0.03	0.04	0.04	0.03
MgO	0.51	0.46	0.48	0.46	0.48	0.50	0.53	0.53	0.43	0.55
CaO	1.76	1.42	1.70	1.61	1.83	1.82	1.98	1.92	1.42	1.80
Na ₂ O	3.49	3.46	3.46	3.45	3.53	3.47	3.45	3.45	3.44	3.54
K ₂ O	4.05	4.32	3.91	3.98	3.83	3.89	3.65	3.74	4.43	4.04
P ₂ O ₅	0.09	0.08	0.10	0.09	0.09	0.09	0.09	0.10	0.08	0.09
LOI	0.50	0.49	0.63	0.71	0.58	0.55	2.18	1.65	0.47	0.52
Total	99.39	99.38	99.41	99.40	99.39	99.39	99.45	99.43	99.38	99.39
Mg#	37	36	34	35	36	36	36	35	35	37
ACNK	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.06	1.05
ANK	1.40	1.34	1.41	1.38	1.43	1.43	1.48	1.45	1.32	1.38
K ₂ O/Na ₂ O	1.16	1.25	1.13	1.15	1.08	1.12	1.06	1.08	1.29	1.14
<u>Trace elements (ppm)</u>										
Ga	14.8	14.9	15.4	15.3	15.4	15.7	13.5	9.03	15.3	15.3
Rb	73.7	87.5	68.4	73.1	73.5	73.1	86.9	52.5	88.2	78.9
Sr	237	230	247	233	264	266	283	99	232	266
Y	15.45	16.05	17.23	16.84	18.43	16.23	15.17	12.16	16.29	15.58
Zr	148	152	156	182	185	172	151	144	149	170
Nb	3.96	4.7	3.83	4.31	4.75	4.12	4.49	4.03	4.62	4.67
Cs										
Ba	682	872	772	718	682	793	887	734	865	768
La	25	28.36	27.43	26.6	32.16	24.88	31.32	20.18	28.8	27.07
Ce	48.55	54.31	53.1	51.67	62.11	48.41	61.28	40.08	57.47	51.66
Pr	5.52	6.04	6.04	5.95	7.1	5.56	6.65	4.6	6.27	5.91

Nd	19.77	22.07	21.73	21.23	25.21	19.88	23.3	16.42	22.4	21.03
Sm	3.27	3.7	3.66	3.61	4.24	3.39	3.67	2.82	3.64	3.52
Eu	0.61	0.69	0.77	0.67	0.68	0.72	0.65	0.56	0.65	0.7
Gd	2.99	3.26	3.2	3.16	3.74	3.08	3.14	2.64	3.32	3.12
Tb	0.46	0.5	0.51	0.51	0.56	0.47	0.45	0.39	0.51	0.48
Dy	2.65	2.79	2.96	2.89	3.24	2.81	2.61	2.25	2.82	2.7
Ho	0.54	0.57	0.61	0.6	0.66	0.57	0.53	0.44	0.58	0.56
Er	1.53	1.65	1.78	1.77	1.91	1.67	1.59	1.33	1.71	1.63
Tm	0.23	0.25	0.26	0.28	0.29	0.26	0.25	0.22	0.26	0.25
Yb	1.72	1.79	1.82	1.95	1.99	1.82	1.75	1.43	1.8	1.76
Lu	0.27	0.28	0.29	0.31	0.33	0.29	0.28	0.24	0.29	0.28
Hf	4.23	4.47	4.59	5.04	5.16	4.83	4.42	4.04	4.45	4.81
Ta	0.43	0.56	0.42	0.5	0.51	0.45	0.5	0.45	0.53	0.49
Pb										
Th	8.39	10.11	6.93	8.08	9.46	7.42	10.07	8.54	10.32	9.28
U	1.96	2.06	1.59	2.06	2.16	1.75	2.06	1.28	2.08	2.12
ΣLREE	102.72	115.17	112.73	109.73	131.5	102.84	126.87	84.66	119.23	109.89
ΣHREE	10.39	11.09	11.43	11.47	12.72	10.97	10.6	8.94	11.29	10.78
Rb/Sr	0.31	0.38	0.28	0.31	0.28	0.27	0.31	0.53	0.38	0.30
Rb/Ba	0.11	0.10	0.09	0.10	0.11	0.09	0.10	0.07	0.10	0.10
Nb/Ta	9.21	8.39	9.12	8.62	9.31	9.16	8.98	8.96	8.72	9.53
Zr/Hf	34.99	34.00	33.99	36.11	35.85	35.61	34.16	35.64	33.48	35.34
Y/Ho	28.61	28.16	28.25	28.07	27.92	28.47	28.62	27.64	28.09	27.82
10000*Ga/Al	1.97	2.02	2.09	2.10	2.04	2.10	1.79	1.21	2.10	2.05
δEu	0.60	0.61	0.69	0.61	0.52	0.68	0.59	0.63	0.57	0.65
TE _{1,3}	0.99	0.98	0.99	1.00	0.98	0.99	0.98	0.99	0.99	0.98
T _{Zr} (°C)	782	786	788	801	803	796	784	780	783	792

TABLE A2 (CONTINUED)

Data Sources	This study							
Lithology	Granite porphyries							
Sample No.	18CA11	18CA12	18CA87	18CA88	18CA89	18CA90	18CA91	18CA92
<u>Major elements (wt.%)</u>								
SiO ₂	72.72	72.54	76.06	72.16	72.73	73.27	74.57	73.50
TiO ₂	0.19	0.19	0.06	0.23	0.21	0.19	0.13	0.13
Al ₂ O ₃	14.02	14.17	12.82	14.11	13.95	13.85	13.07	13.66
Fe ₂ O ₃ T	2.01	2.00	0.88	2.12	2.02	1.65	1.50	1.23
MnO	0.05	0.03	0.02	0.04	0.03	0.04	0.04	0.03
MgO	0.53	0.56	0.10	0.53	0.52	0.44	0.37	0.29
CaO	1.77	0.89	0.84	1.88	1.97	1.06	0.97	0.92
Na ₂ O	3.68	4.15	3.48	3.65	3.60	4.00	3.56	3.53
K ₂ O	3.81	4.35	4.80	3.76	3.76	4.36	4.52	5.43
P ₂ O ₅	0.07	0.08	0.02	0.08	0.07	0.06	0.05	0.04
LOI	1.07	0.93	0.44	0.58	0.57	0.69	0.69	1.15
Total	99.92	99.89	99.52	99.14	99.43	99.61	99.47	99.91
Mg#	34	36	18	33	34	35	33	32
ACNK	1.05	1.08	1.03	1.05	1.03	1.05	1.04	1.02
ANK	1.38	1.23	1.17	1.40	1.40	1.23	1.22	1.17

K ₂ O/Na ₂ O	1.04	1.05	1.38	1.03	1.04	1.09	1.27	1.54
<u>Trace elements (ppm)</u>								
Ga	14.83	14.09	13.43	15.68	15.53	14.64	13.35	12.17
Rb	96.3	112	128.9	66.59	74.11	117.4	92.12	145.7
Sr	255.4	166.5	78.1	247.9	244.1	290.3	134.3	159.2
Y	13.87	15.69	20.08	20.96	17.24	13.62	13.71	15.84
Zr	131.1	127.5	69.63	171.1	143.9	125.7	108.3	114
Nb	4.609	5.101	7.141	5.521	5.045	5.861	5.266	7.778
Cs	1.961	1.57	1.157	1.447	0.828	1.416	0.896	0.708
Ba	742	711.6	374.9	628	721.7	740.6	655.5	682.9
La	19.89	21.32	18.19	25.9	22.06	22.98	16.52	24.32
Ce	37.31	38.02	36.27	55.07	42.76	42.09	33.43	43.79
Pr	4.009	4.381	4.14	6.165	4.956	4.565	3.464	4.763
Nd	14.77	16.01	14.67	22.58	18.03	15.68	12.39	16.15
Sm	2.57	2.852	3.073	4.046	3.178	2.632	2.298	2.771
Eu	0.556	0.542	0.321	0.682	0.621	0.526	0.392	0.454
Gd	2.36	2.598	2.876	3.6	2.833	2.296	2.132	2.504
Tb	0.352	0.393	0.489	0.55	0.44	0.341	0.346	0.386
Dy	2.122	2.291	2.963	3.279	2.622	2.026	2.151	2.367
Ho	0.45	0.497	0.627	0.689	0.561	0.425	0.459	0.503
Er	1.298	1.418	1.744	1.94	1.605	1.225	1.338	1.484
Tm	0.205	0.219	0.269	0.303	0.245	0.197	0.221	0.24
Yb	1.464	1.564	1.863	2.08	1.771	1.38	1.548	1.743
Lu	0.241	0.254	0.29	0.325	0.283	0.235	0.249	0.288
Hf	3.824	3.892	3.035	5.012	4.292	3.832	3.61	3.669
Ta	0.472	0.496	0.728	0.448	0.419	0.606	0.563	0.859
Pb	14.3	12.15	18.52	12.23	11.99	17.65	16.94	13.6
Th	9.777	11.37	14.02	7.346	6.175	11.4	11	12.88
U	2.2	2.41	2.281	1.53	1.233	3.345	1.508	2.357
ΣLREE	79.105	83.125	76.664	114.443	91.605	88.473	68.494	92.248
ΣHREE	8.492	9.234	11.121	12.766	10.36	8.125	8.444	9.515
Rb/Sr	0.38	0.67	1.65	0.27	0.30	0.40	0.69	0.92
Rb/Ba	0.13	0.16	0.34	0.11	0.10	0.16	0.14	0.21
Nb/Ta	9.76	10.28	9.81	12.32	12.04	9.67	9.35	9.05
Zr/Hf	34.28	32.76	22.94	34.14	33.53	32.80	30.00	31.07
Y/Ho	30.82	31.57	32.03	30.42	30.73	32.05	29.87	31.49
10000*Ga/Al	2.00	1.88	1.98	2.10	2.10	2.00	1.93	1.68
δEu	0.69	0.61	0.33	0.55	0.63	0.65	0.54	0.53
TE _{1,3}	0.96	0.94	1.01	1.00	0.97	0.97	1.00	0.97
T _{Zr} (°C)	770	769	722	792	776	767	756	757

TABLE A2 (CONTINUED)

Data Sources		this study								
Lithology	Two-mica granites									
Sample No.	18CA57	18CA59	18CA67	18CA73	18CA76	18CA80	18CA82	18CA83-1	18CA83-2	18CA85
<u>Major elements (wt.%)</u>										
SiO ₂	76.63	74.16	75.09	76.71	74.73	74.25	76.35	76.14	74.07	74.35
TiO ₂	0.08	0.07	0.03	0.04	0.05	0.04	0.05	0.04	0.04	0.04
Al ₂ O ₃	14.32	14.89	14.94	12.60	14.08	14.15	13.19	13.31	14.52	14.21
Fe ₂ O ₃ T	0.94	0.92	0.61	0.75	0.55	0.47	0.52	0.54	0.75	0.64
MnO	0.01	0.03	0.03	0.01	0.02	0.01	0.01	0.01	0.04	0.03
MgO	0.23	0.22	0.14	0.04	0.07	0.06	0.06	0.07	0.15	0.12
CaO	0.74	1.89	1.23	0.66	0.63	0.76	0.71	0.51	0.48	0.50
Na ₂ O	1.85	6.40	5.65	2.46	4.18	4.65	3.54	3.99	3.95	4.78
K ₂ O	3.23	0.57	1.54	6.56	5.51	4.57	4.91	4.99	4.60	4.01
P ₂ O ₅	0.16	0.05	0.06	0.05	0.12	0.04	0.06	0.04	0.25	0.26
LOI	1.38	0.24	0.48	0.09	0.23	0.21	0.39	0.23	0.66	0.36
Total	99.57	99.44	99.80	99.97	100.17	99.21	99.79	99.87	99.51	99.30
Mg#	33	32	31	10	20	20	19	20	28	27
ACNK	1.82	1.02	1.13	1.02	1.01	1.01	1.06	1.03	1.18	1.08
ANK	2.19	1.34	1.36	1.13	1.10	1.12	1.18	1.11	1.27	1.16
K ₂ O/Na ₂ O	1.75	0.09	0.27	2.67	1.32	0.98	1.39	1.25	1.16	0.84
<u>Trace elements (ppm)</u>										
Ga	15.03	15.88	14.43	14.45	17.81	20.36	13.78	13.69	15.99	14.86
Rb	155.5	25.07	40.34	170.5	250.9	203.2	246.1	161.6	212.9	231.9
Sr	40.57	77.32	28.08	55.26	20.9	9.538	60.15	20.81	27.25	14.67
Y	25.84	40.95	27.73	59.72	16.73	41.71	35.84	11.01	8.769	6.988
Zr	67.92	28.9	41.54	74	24.84	28.72	57.06	46	22.47	31.7
Nb	12.82	8.833	8.335	13.59	13.02	23.7	7.935	12.11	15.51	9.384
Cs	4.03	1.794	1.058	1.703	4.128	4.753	4.318	6.153	6.844	11.38
Ba	133	32.04	14.34	316.3	56.05	20.17	189	22.72	63.78	51.27
La	11.42	11.33	11.16	10.1	3.817	9.874	7.652	4.311	2.661	3.437
Ce	25.15	24.83	23.6	24.59	8.729	24	14.84	7.441	5.744	7.04
Pr	3.258	3.239	3.006	3.581	1.145	3.244	1.883	0.842	0.678	0.91
Nd	12.62	12.94	10.78	15.33	4.218	12.18	6.977	2.851	2.518	3.293
Sm	3.414	4.013	3.266	4.807	1.351	4.447	2.057	0.788	0.707	0.881
Eu	0.35	0.607	0.256	0.649	0.172	0.152	0.395	0.141	0.155	0.107
Gd	3.237	4.397	3.04	5.587	1.553	4.32	2.617	0.861	0.761	0.88
Tb	0.668	0.988	0.664	1.236	0.359	0.981	0.639	0.198	0.171	0.182
Dy	4.111	6.426	4.133	8.786	2.449	6.118	4.671	1.458	1.149	1.143
Ho	0.825	1.28	0.849	1.984	0.518	1.228	1.117	0.349	0.242	0.217
Er	2.335	3.785	2.551	5.71	1.519	3.576	3.456	1.126	0.7	0.6
Tm	0.392	0.707	0.519	0.89	0.257	0.636	0.586	0.221	0.119	0.099
Yb	2.888	5.32	4.43	6.055	1.906	4.682	4.196	1.706	0.878	0.714
Lu	0.446	0.853	0.712	0.904	0.294	0.727	0.653	0.314	0.133	0.108
Hf	2.666	1.378	2.262	5.118	1.449	2.447	2.653	2.611	1.099	1.679
Ta	1.335	1.954	1.429	1.933	1.06	3.218	1.224	1.579	3.032	2.475
Pb	22.52	17.77	31.7	25.22	23.66	33.78	36.98	33.31	23.41	24.22
Th	12.49	9.643	8.433	23.39	4.509	10.5	11.48	18.8	1.472	2.045
U	4.23	3.349	5.891	4.582	1.565	4.268	2.499	2.451	0.865	1.173

ΣLREE	56.212	56.959	52.068	59.057	19.432	53.897	33.804	16.374	12.463	15.668
ΣHREE	14.902	23.756	16.898	31.152	8.855	22.268	17.935	6.233	4.153	3.943
Rb/Sr	3.83	0.32	1.44	3.09	12.00	21.30	4.09	7.77	7.81	15.81
Rb/Ba	1.17	0.78	2.81	0.54	4.48	10.07	1.30	7.11	3.34	4.52
Nb/Ta	9.60	4.52	5.83	7.03	12.28	7.36	6.48	7.67	5.12	3.79
Zr/Hf	25.48	20.97	18.36	14.46	17.14	11.74	21.51	17.62	20.45	18.88
Y/Ho	31.32	31.99	32.66	30.10	32.30	33.97	32.09	31.55	36.24	32.20
10000*Ga/Al	1.98	2.01	1.82	2.17	2.39	2.72	1.97	1.94	2.08	1.98
δEu	0.32	0.44	0.25	0.38	0.36	0.11	0.52	0.52	0.65	0.37
TE _{1,3}	1.08	1.10	1.10	1.07	1.12	1.14	1.06	1.03	1.10	1.09
T _{Zr} (°C)	761	654	689	726	644	654	709	690	649	666

TABLE A2 (CONTINUED)

Data Sources	this study					Hu et al.(2021)				
Lithology	Muscovite granites					Leucogranites				
Sample No.	18CA63	18CA66	18CA84	AT38A	AT39A	AT40	AT41	AT43	AT44	AT45
<u>Major elements (wt.%)</u>										
SiO ₂	74.51	74.65	76.04	75.50	73.60	73.60	74.80	76.30	71.90	79.10
TiO ₂	0.02	0.02	0.04	0.03	0.02	0.03	0.01	0.02	0.17	0.03
Al ₂ O ₃	14.29	14.29	13.62	13.50	14.80	15.20	14.40	13.80	15.00	13.30
Fe ₂ O ₃ T	0.87	0.75	0.66	0.70	0.84	1.10	1.12	0.58	2.07	0.67
MnO	0.13	0.23	0.12	0.02	0.01	0.01	0.56	0.01	0.04	0.11
MgO	0.09	0.05	0.07	0.06	0.06	0.07	0.06	0.06	0.53	0.08
CaO	0.42	0.46	0.54	0.91	0.54	1.54	0.88	1.57	0.76	1.14
Na ₂ O	4.46	4.81	4.38	3.77	3.99	5.41	4.36	6.30	1.98	3.35
K ₂ O	3.97	3.63	3.77	4.91	5.89	2.46	4.48	0.46	5.56	1.48
P ₂ O ₅	0.13	0.07	0.03	0.02	0.02	0.01	0.03	0.11	0.32	0.02
LOI	0.37	0.33	0.00	0.16	0.32	0.27	0.18	0.23	1.04	0.78
Total	99.26	99.29	99.27	99.60	100.10	99.70	100.80	99.40	99.40	100.10
Mg#	17	12	17	15	12	11	10	17	34	19
ACNK	1.15	1.13	1.11	1.03	1.06	1.06	1.06	1.01	1.41	1.45
ANK	1.23	1.21	1.21	1.17	1.14	1.31	1.20	1.27	1.62	1.87
K ₂ O/Na ₂ O	0.89	0.75	0.86	1.30	1.48	0.45	1.03	0.07	2.81	0.44
<u>Trace elements (ppm)</u>										
Ga	15.88	19.03	23.15	14.8	15.7	16.2	17	16.3	20.8	16
Rb	168.1	397.1	212.9	131	161	66	190	13	207	46
Sr	1.669	1.649	3.736	34.6	41.2	56.7	21.4	29.3	57.6	93.3
Y	2.671	56.5	30.69	82.4	53	68.5	44.3	18.4	25	33.1
Zr	23.91	29.53	22.84	30	43	28	45	22	81	45
Nb	7.149	37.5	39.77	6.3	2.5	3.1	0.8	3.1	18.5	10.7
Cs	15.06	14.72	11.01	2.66	2.26	1.67	7.75	0.8	4.64	0.82
Ba	3.709	3.251	5.038	45.3	81.9	43.3	18.9	8.4	203	102
La	0.553	14.33	4.909	11.4	1.7	2.7	6.7	5.2	15.5	8.1
Ce	1.881	52.59	11.3	25	3.6	3.6	15.6	10.7	33.5	17.2
Pr	0.153	5.194	1.545	3.23	0.46	0.56	1.98	1.34	3.99	2.1
Nd	0.537	21.27	5.951	13.9	2.5	2.8	8.2	5.6	16.5	8.7
Sm	0.181	6.36	2.392	4.87	1.37	1.57	2.95	2.22	3.98	2.7
Eu	0.008	0.006	0.085	0.48	0.33	0.63	0.24	0.15	0.52	0.34

Gd	0.185	6.129	2.654	6.79	3.53	3.78	2.76	2.87	3.93	2.68
Tb	0.046	1.3	0.693	1.49	0.81	1.04	0.75	0.48	0.66	0.6
Dy	0.332	8.352	4.599	11.7	7.1	8.4	6	3	4.4	4.7
Ho	0.072	1.73	0.928	2.65	1.71	2.18	1.41	0.51	0.81	0.99
Er	0.229	5.162	2.753	9.09	6.12	8.11	6.13	1.72	2.23	3.94
Tm	0.051	1.054	0.54	1.49	1.01	1.2	1.34	0.29	0.33	0.78
Yb	0.441	8.82	4.409	11.1	7.6	8	12.5	2.2	2.2	7.2
Lu	0.069	1.416	0.683	1.73	1.24	1.21	2.27	0.33	0.36	1.22
Hf	1.512	2.577	2.472	1.7	2.1	1.1	2.5	1.1	3	2.7
Ta	1.252	12.36	5.515	1.9	0.6	0.4	0.1	0.2	1.2	1.8
Pb	15.76	17.34	27.81	62.4	73.1	78.2	105.2	50.3	65.2	118.4
Th	0.659	7.579	9.289	18.1	16.3	24.7	8.6	5.8	12.1	7.6
U	1.056	5.201	2.834	6.01	4.02	2.77	3.7	1.87	3.88	3.33
ΣLREE	3.313	99.75	26.182	58.88	9.96	11.86	35.67	25.21	73.99	39.14
ΣHREE	1.425	33.963	17.259	46.04	29.12	33.92	33.16	11.4	14.92	22.11
Rb/Sr	100.72	240.81	56.99	3.79	3.91	1.16	8.88	0.44	3.59	0.49
Rb/Ba	45.32	122.15	42.26	2.89	1.97	1.52	10.05	1.55	1.02	0.45
Nb/Ta	5.71	3.03	7.21	3.32	4.17	7.75	8.00	15.50	15.42	5.94
Zr/Hf	15.81	11.46	9.24	17.65	20.48	25.45	18.00	20.00	27.00	16.67
Y/Ho	37.10	32.66	33.07	31.09	30.99	31.42	31.42	36.08	30.86	33.43
10000*Ga/Al	2.10	2.52	3.21	2.07	2.00	2.01	2.23	2.23	2.62	2.27
δEu	0.13	0.00	0.10	0.26	0.46	0.79	0.26	0.18	0.40	0.39
TE _{1,3}	1.27	1.21	1.16	1.04	0.96	0.90	1.11	1.03	1.03	1.06
T _{Zr} (°C)	652	665	648	659	684	654	688	638	755	716

TABLE A2 (CONTINUED)

Data Sources		Hu et al.(2021)							
Lithology		Leucogranites							
Sample No.	AT48	AT49A	AT50	AT51A	AT52	AT53	AT55	AT56	AT57A
<u>Major elements (wt.%)</u>									
SiO ₂	77.90	74.70	73.80	81.20	75.20	75.90	75.10	75.80	73.90
TiO ₂	0.05	0.06	0.01	0.02	0.16	0.07	0.05	0.02	0.05
Al ₂ O ₃	14.10	15.70	14.60	11.10	14.60	13.70	13.90	14.80	14.80
Fe ₂ O ₃ T	1.22	1.10	1.54	0.59	1.88	0.90	0.99	1.68	1.30
MnO	0.30	0.10	0.66	0.08	0.04	0.03	0.05	0.63	0.18
MgO	0.17	0.25	0.09	0.06	0.47	0.20	0.16	0.10	0.18
CaO	0.46	0.67	0.39	0.69	0.80	0.51	0.50	0.36	0.39
Na ₂ O	1.32	2.02	5.32	4.99	1.86	3.31	3.72	3.94	4.32
K ₂ O	3.23	3.36	3.07	0.83	3.44	5.27	4.38	2.17	3.63
P ₂ O ₅	0.18	0.36	0.18	0.06	0.31	0.23	0.32	0.18	0.36
LOI	1.44	1.98	0.32	0.29	1.51	0.51	0.70	0.93	0.72
Total	100.30	100.30	100.00	99.90	100.20	100.50	99.90	100.60	99.80
Mg#	22	31	10	17	33	31	24	11	22
ACNK	2.17	1.92	1.14	1.07	1.77	1.13	1.18	1.56	1.26
ANK	2.49	2.26	1.21	1.22	2.15	1.23	1.28	1.68	1.34
K ₂ O/Na ₂ O	2.45	1.66	0.58	0.17	1.85	1.59	1.18	0.55	0.84
<u>Trace elements (ppm)</u>									
Ga	19.6	21.5	20.8	14.9	17.2	14.4	15	23.3	19.8

Rb	153	143	250	38	164	234	241	174	290
Sr	10.9	27.5	10.2	15.4	77.2	65.3	39	9	8.1
Y	15.6	12.4	23.5	25.9	29.4	11.2	9.9	40.5	9.3
Zr	16	31	33	13	94	44	37	24	33
Nb	39.7	24.3	16.4	8	12.6	8.6	12.9	40.6	22
Cs	2.28	1.9	5.81	2.96	6.59	16.6	7.09	3.38	14.55
Ba	14.9	29.4	15.6	14.1	283	221	146	26.7	24.8
La	2.2	3.9	4.1	6.4	21.5	8.6	6	2.6	3.3
Ce	5.3	9.2	10	14.6	48.5	19.5	13	7	7.7
Pr	0.64	1.05	1.28	1.83	5.59	2.26	1.4	0.98	0.92
Nd	2.8	4	5	8.2	22.6	8.7	5.5	4.3	3.2
Sm	1.22	1.45	2.04	2.89	5.22	2.08	1.71	1.82	1
Eu	0.1	0.12	0.05	0.09	0.62	0.25	0.25	0.04	0.09
Gd	1.67	1.51	2.28	2.7	4.78	1.88	1.45	2.3	1.07
Tb	0.38	0.29	0.49	0.59	0.81	0.34	0.23	0.75	0.19
Dy	2.3	2.1	3.7	3.8	5.7	2	1.6	6	1.5
Ho	0.49	0.38	0.69	0.77	1.05	0.41	0.33	1.13	0.3
Er	1.77	1.11	1.92	2.34	2.97	1.15	1.05	3.94	1.08
Tm	0.31	0.21	0.39	0.46	0.41	0.16	0.15	0.76	0.17
Yb	3	1.4	3.5	3.5	3	1.1	1.1	6.4	1.3
Lu	0.54	0.21	0.51	0.55	0.46	0.19	0.2	0.93	0.2
Hf	1	2	2.3	1	3.1	1.6	1.5	2	2
Ta	9.6	4.2	2.5	0.9	1.7	1.3	3	19.3	6.8
Pb	18	18.3	16.8	51	75.1	35	29.4	19.3	21.4
Th	4.2	4.2	4.5	5.7	16.3	7.3	5.3	4.2	3.6
U	2.44	3.54	2.25	1.77	3.93	1.12	3.58	2.23	2.86
ΣLREE	12.26	19.72	22.47	34.01	104.03	41.39	27.86	16.74	16.21
ΣHREE	10.46	7.21	13.48	14.71	19.18	7.23	6.11	22.21	5.81
Rb/Sr	14.04	5.20	24.51	2.47	2.12	3.58	6.18	19.33	35.80
Rb/Ba	10.27	4.86	16.03	2.70	0.58	1.06	1.65	6.52	11.69
Nb/Ta	4.14	5.79	6.56	8.89	7.41	6.62	4.30	2.10	3.24
Zr/Hf	16.00	15.50	14.35	13.00	30.32	27.50	24.67	12.00	16.50
Y/Ho	31.84	32.63	34.06	33.64	28.00	27.32	30.00	35.84	31.00
10000*Ga/Al	2.63	2.59	2.69	2.54	2.23	1.99	2.04	2.97	2.53
δEu	0.21	0.25	0.07	0.10	0.38	0.39	0.49	0.06	0.27
TE _{1,3}	1.08	1.11	1.14	1.06	1.05	1.05	1.00	1.25	1.09
T _{Zr} (°C)	661	701	672	614	786	694	685	672	680

Note: $Mg\# = (100 \times MgO / 40.31) / (MgO / 40.31 + 0.8998 \times Fe_2O_3T / 71.85)$;

$\delta Eu = Eu_N / (Sm_N \times Gd_N)^{1/2}$, where subscript N denotes chondrite normalization;

TE_{1,3} was from Irber, 1999;

T_{Zr}(°C) was from Watson and Harrison, 1983.

TABLE S7. WHOLE-ROCK SR AND ND ISOTOPE DATA FOR GRANITE DYKES FROM THE SOUTHERN CHINESE ALTAI

Sample	Rb	Sr	Sm	Nd	⁸⁷ Rb/ ⁸⁶ Sr	⁸⁷ Sr/ ⁸⁶ Sr	(⁸⁷ Sr/ ⁸⁶ Sr) _i	¹⁴⁷ Sm/ ¹⁴⁴ Nd	¹⁴³ Nd/ ¹⁴⁴ Nd	(¹⁴³ Nd/ ¹⁴⁴ Nd) _i	f _{Sm/Nd}	ε _{Nd} (t)	T _{DM-1}	T _{DM-2}
Fuyun granite dykes														
18CA11	96.3	255.4	2.57	14.77	1.053	0.7087	0.7048	0.105	0.5128	0.5126	-0.47	5.8	525	560
18CA89	74.11	244.1	3.178	18.03	0.848	0.7071	0.7039	0.106	0.5128	0.5126	-0.46	6.1	506	535
18CA90	117.4	290.3	2.632	15.68	1.129	0.7083	0.7040	0.101	0.5128	0.5126	-0.48	5.7	527	573
Kalasu-Aletai granite dykes														
18CA59	25.07	77.32	4.013	12.94	0.905	0.7135	0.7101	0.187	0.5125	0.5122	-0.05	-1.4	3468	1144
18CA67	40.34	28.08	3.266	10.78	4.011	0.7259	0.7108	0.183	0.5124	0.5121	-0.07	-4.0	3672	1354
18CA73	170.5	55.26	4.807	15.33	8.615	0.7508	0.7183	0.189	0.5126	0.5123	-0.04	-0.2	3347	1044
18CA76	250.9	20.9	1.351	4.218	33.518	0.8241	0.6978	0.194	0.5126	0.5122	-0.02	-1.0	4275	1107
18CA79	214	82.97	4.101	20.81	7.201	0.7325	0.7053	0.119	0.5121	0.5119	-0.39	-7.6	1666	1650
18CA83	212.9	27.25	0.707	2.518	21.814	0.7891	0.7069	0.170	0.5125	0.5122	-0.14	-2.4	2348	1223
18CA66	397.1	1.649	6.36	21.27	672.368			0.181	0.5126	0.5123	-0.08	-0.8	2672	1094
18CA84	212.9	3.736	2.392	5.951	159.110			0.243	0.5129	0.5125	0.23	3.0	-1446	789

Note: Ages are in Ma and elements in ppm.

$$(^{87}\text{Sr}/^{86}\text{Sr})_i = (^{87}\text{Sr}/^{86}\text{Sr})_s - (^{87}\text{Rb}/^{86}\text{Sr})_s \times (e^{\lambda t} - 1);$$

$$(^{143}\text{Nd}/^{144}\text{Nd})_i = (^{143}\text{Nd}/^{144}\text{Nd})_s - (^{147}\text{Sm}/^{144}\text{Nd})_s \times (e^{\lambda t} - 1);$$

$$\epsilon_{\text{Nd}}(t) = ((^{143}\text{Nd}/^{144}\text{Nd})_s / (^{143}\text{Nd}/^{144}\text{Nd})_{\text{CHUR}} - 1) \times 10,000;$$

$$f_{\text{Sm/Nd}} = (^{147}\text{Sm}/^{144}\text{Nd})_s / (^{147}\text{Sm}/^{144}\text{Nd})_{\text{CHUR}} - 1;$$

$$T_{\text{DM-1}} = 1/\lambda_{\text{Sm}} \times \ln(1 + ((^{143}\text{Nd}/^{144}\text{Nd})_s - 0.51315) / ((^{147}\text{Sm}/^{144}\text{Nd})_s - 0.2137));$$

$$T_{\text{DM-2}} = T_{\text{DM-1}} - (T_{\text{DM-1}} - t) \times (-0.4 - f_{\text{Sm/Nd}}) / (-0.4 - 0.08592);$$

Where S= sample, t = age, (¹⁴³Nd/¹⁴⁴Nd)_{CHUR} = 0.512638, (¹⁴⁷Sm/¹⁴⁴Nd)_{CHUR} = 0.1967.