Huang, B., Wang, W., Zhao, J.H., Khattak, N.V., Huang, S.F., Lu, G.M., Xue, E.K., and Sun, L., 2023, Coupled alkaline high-Nb mafic rocks and adakitic granodiorites: Products of Neoproterozoic back-arc extension at the western margin of the Yangtze Block, South China: GSA Bulletin, https://doi.org/10.1130/B36618.1.

Supplemental Material

Figure S1. Chondrite-normalized rare earth element (REE) distribution patterns of zircon grains from Yuanmou granodiorite, gabbros, and alkaline basalts.

Figure S2. Zr versus elements diagram for the Yuanmou pluton and associated dike to evaluate post-crystallization mobility of major and trace elements.

Figure S3. Harker diagram of Yuanmou adakitic and mafic rocks, magmatic evolution was simulated by using the software "Magma Chamber Simulator" with recharge and fractional crystallization (RFC) processes.

Figure S4. Plots of εHf(t) versus εNd(t) diagram for the Neoproterozoic adakitic rocks from the western margin of the Yangtze Block.

Table S1. Concordant results of zircon U-Pb ages for the Neoproterozoic Yuanmou granodiorite pluton and its mafic microgranular enclaves (MMEs) and associated dike.

Table S2. The major element analysis results of plagioclases for the Yuanmou granodiorites and MMEs and the major element analysis results of amphiboles and clinopyroxenes for the Yuanmou MMEs.

Table S3. The major and trace element analysis results for the Neoproterozoic adakitic, alkaline mafic and sub-alkaline mafic pluton in the western margin of the Yangtze Block.

Table S4. The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block.

File S1. Original file of MCS. Magmatic evolution simulation of Yuanmou adakitic and mafic rocks, simulated by using the software "Magma Chamber Simulator" with recharge and fractional crystallization (RFC) processes.

Huang, B., Wang, W., Zhao, J.H., Khattak, N.V., Huang, S.F., Lu, G.M., Xue, E.K., and Sun, L., 2023, Coupled alkaline high-Nb mafic rocks and adakitic granodiorites: Products of Neoproterozoic back-arc extension at the western margin of the Yangtze Block, South China: GSA Bulletin, https://doi.org/10.1130/B36618.1.

Supplementary materials

Fig. S1 Chondrite-normalized REE distribution patterns of zircon grains from Yuanmou granodiorite, gabbros, and alkaline basalts.

Fig. S2 Zr versus elements diagram for the Yuanmou pluton and associated dike to evaluate post-crystallization mobility of major and trace elements.

Fig. S3 Harker diagram of Yuanmou adakitic and mafic rocks, magmatic evolution was simulated by using the soft 'Magma Chamber Simulator' (Bohrson et al. 2014) with Recharge, and Fractional crystallization (RFC) processes, in which the H_2O contents of melts were set as 2 wt. % and the 'Oxygen Fugacity' were using 'NNO'(Nickle Nickle Oxygen fugacity), Original file of MCS are shown in the File S1.

Fig. S4 Plots of $\varepsilon_{Hf(t)}$ vs $\varepsilon_{Nd(t)}$ diagram for the Neoproterozoic adakitic rocks from the western margin of the Yangtze Block (modified by Zhao et al. (2021)). The short-dotted line displays the mixing trend between the mantle wedge (ε_{Hf} = +14, ε_{Nd} = +8) and the sediment melt; the long-dotted line shows mixing path between AOC melt (ε_{Hf} = +14, ε_{Nd} = +8) and sediment melt (ε_{Hf} = -13.7, ε_{Nd} = -15.54). The grey thicker line represents mixing between AOC fluid and sediment fluid, and the grey thinner lines show the trend of the addition of slab-derived fluids into the mantle source. Trace element concentrations of the mixing members are from Hanyu et al. (2006), and the calculated mixing lines are from (Wang et al. 2016; Zhao et al. 2019). The numbers are percentages of sediment fluids or melts. The Neoproterozoic gabbros are also shown for comparison (Wang et al. 2016; Zhao et al. 2019). The evolution curve for ancient sediments is from Chauvel et al. (2008).

Table S1 Concordant results of zircon U-Pb ages for the Neoproterozoic Yuanmou granodiorite pluton and its MMEs and associated dike.

Table S2 The major analysis results of plagioclases for the Yuanmou granodiorites and MMEs and the major analysis results of amphiboles and clinopyroxenes for the Yuanmou MMEs.

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Block.

Table S4 The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block.

File S1 Original file of MCS. Magmatic evolution simulation of Yuanmou adakitic and mafic rocks, simulated by using the soft 'Magma Chamber Simulator' (Bohrson et al. 2014) with Recharge, and Fractional crystallization (RFC) processes, in which the H_2O contents of melts were set as 2 wt.% and the 'Oxygen Fugacity' were using 'NNO'(Nickle Nickle Oxygen fugacity).

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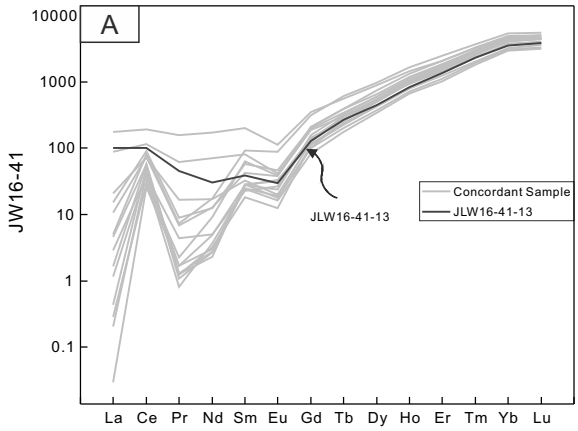
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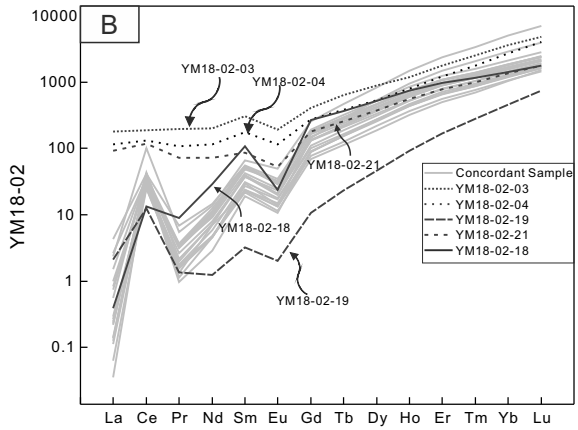
Concordant Sample
JLW16-41-13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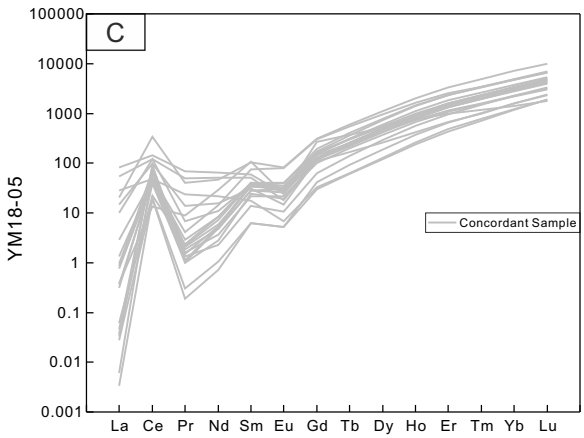
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Fig. S1

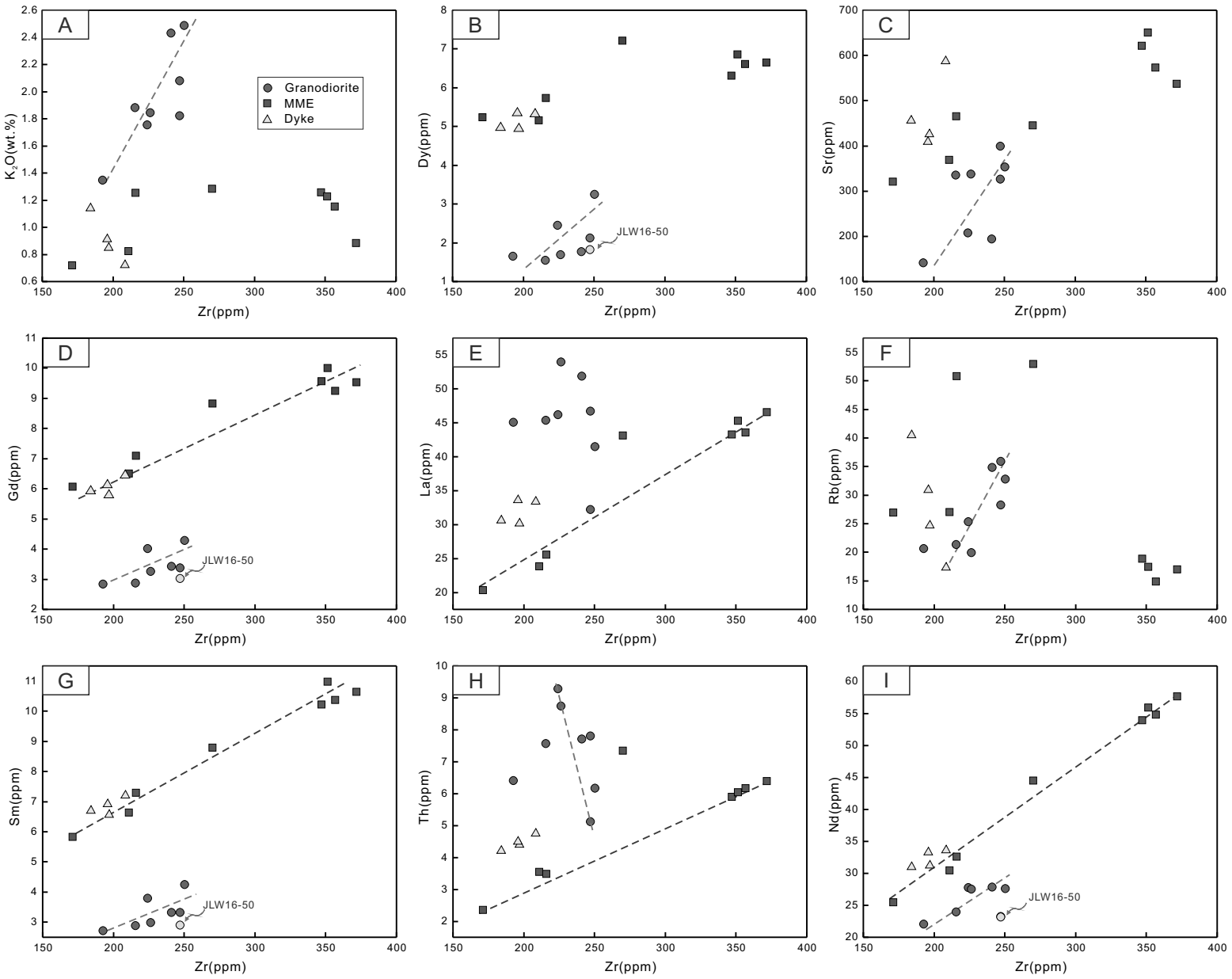
A
B
C
D
E
F
G
H
I
Granodiorite
MME
Dyke
JLW16-50
K2O(wt.%)
Dy(ppm)
Sr(ppm)
Gd(ppm)
La(ppm)
Rb(ppm)
Sm(ppm)
Th(ppm)
Nd(ppm)
Zr(ppm)

Fig. S2

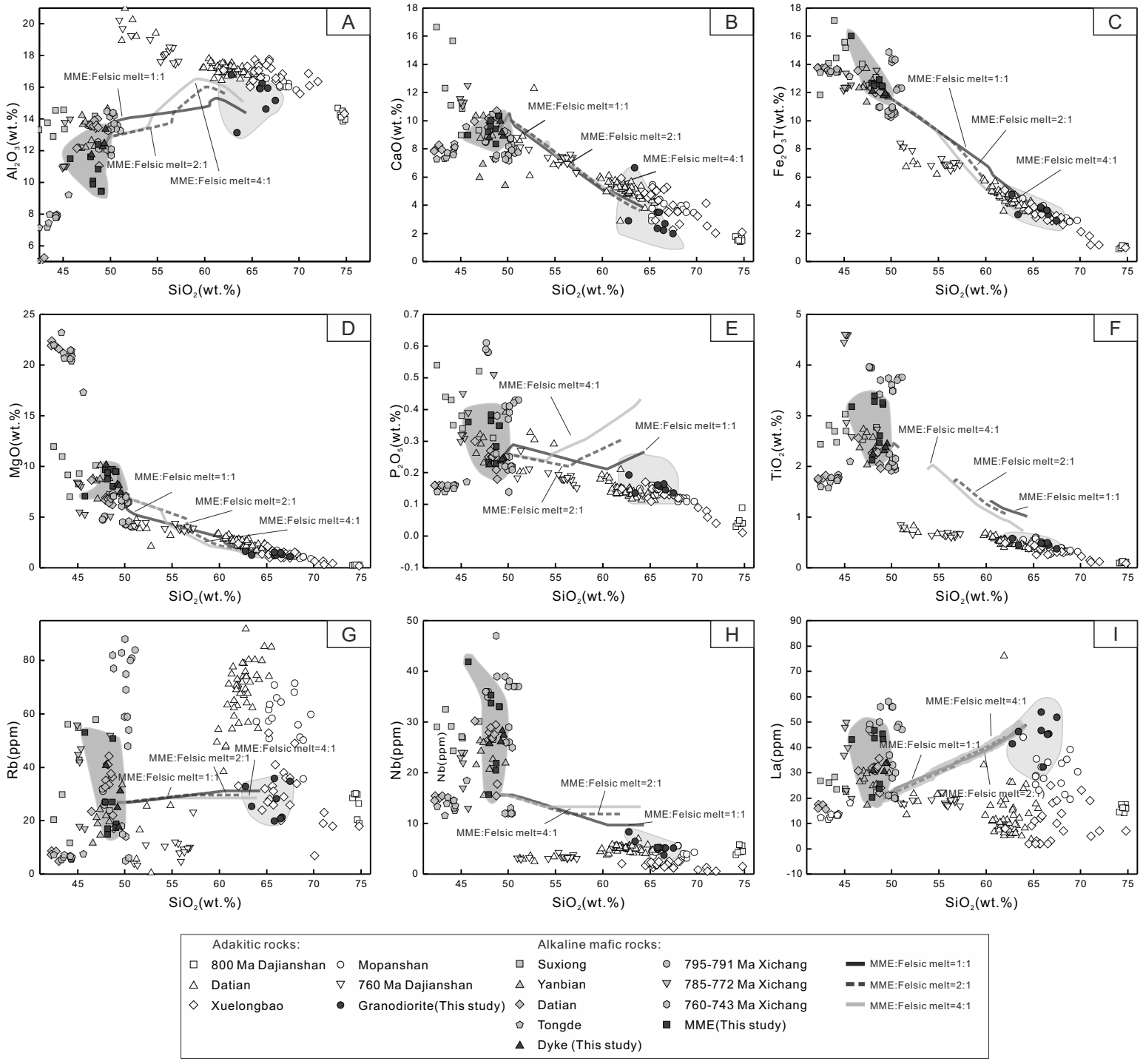
A
B
C
D
E
F
G
H
I
MME:Felsic melt=1:1
MME:Felsic melt=2:1
MME:Felsic melt=4:1
Al2O3(wt.%)
CaO(wt.%)
Fe2O3T(wt.%)
MgO(wt.%)
P2O5(wt.%)
TiO2(wt.%)
Rb(ppm)
Nb(ppm)
La(ppm)
SiO2(wt.%)
Adakitic rocks:
800 Ma Dajianshan
Datian
Xuelongbao
Mopanshan
760 Ma Dajianshan
Granodiorite(This study)
Alkaline mafic rocks:
Suxiong
Yanbian
Datian
Tongde
Dyke (This study)
795-791 Ma Xichang
785-772 Ma Xichang
760-743 Ma Xichang
MME(This study)
MME:Felsic melt=1:1
MME:Felsic melt=2:1
MME:Felsic melt=4:1

Fig. S3

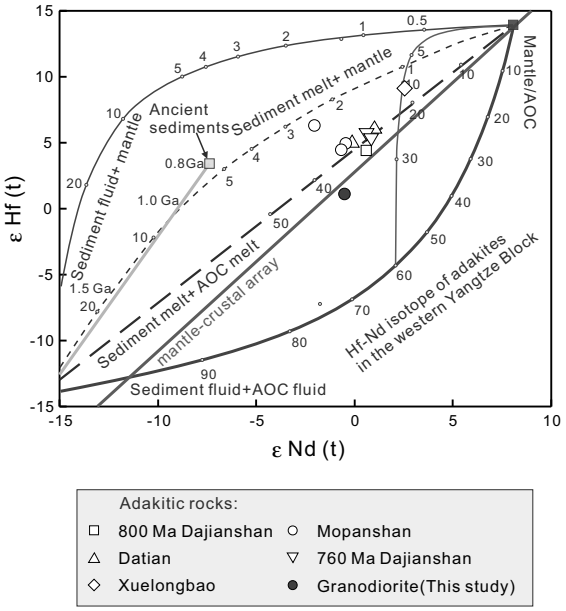
ε Hf (t)
ε Nd (t)
Sediment fluid+ mantle
Ancient sediments
Sediment melt+ mantle
Mantle/AOC
0.8Ga
1.0 Ga
1.5 Ga
Sediment melt+ AOC melt
mantle-crustal array
Hf-Nd isotope of adakites in the western Yangtze Block
Sediment fluid+AOC fluid
Adakitic rocks:
800 Ma Dajianshan
Mopanshan
Datian
760 Ma Dajianshan
Xuelongbao
Granodiorite(This study)

Fig. S4

Table S1: Concordant results of zircon U-Pb ages for the Neoproterozoic Yuanmou granodiorite pluton and its MMEs and associated dike

Sample No.	Th/U	Isotopic ratios								Rho	Age (Ma)							
		$^{207}Pb/$		$^{207}Pb/$		$^{206}Pb/$		$^{208}Pb/$			$^{207}Pb/$		$^{207}Pb/$		$^{206}Pb/$		$^{208}Pb/$	
		^{206}Pb	1σ	^{235}U	1σ	^{238}U	1σ	^{232}Th	1σ		^{206}Pb	1σ	^{235}U	1σ	^{238}U	1σ	^{232}Th	1σ
JLW16-41(Granodiorite)																		
JLW16-41-01	0.5	0.0656	0.0008	1.2521	0.0200	0.1385	0.0018	0.0592	0.0014	0.8174	791	27	824	9	836	10	1163	27
JLW16-41-02	0.5	0.0660	0.0007	1.2625	0.0209	0.1387	0.0021	0.0545	0.0012	0.9072	806	22	829	9	837	12	1072	24
JLW16-41-03	0.7	0.0651	0.0007	1.2130	0.0176	0.1351	0.0017	0.0522	0.0010	0.8672	777	223	807	8	817	10	1028	20
JLW16-41-04	0.6	0.0662	0.0007	1.2528	0.0187	0.1371	0.0016	0.0567	0.0014	0.7652	813	22	825	8	828	9	1115	27
JLW16-41-05	0.5	0.0647	0.0010	1.2133	0.0208	0.1363	0.0017	0.0537	0.0017	0.7370	765	32	807	10	824	10	1058	33
JLW16-41-06	0.7	0.0646	0.0010	1.2248	0.0233	0.1374	0.0016	0.0540	0.0018	0.6249	761	33	812	11	830	9	1064	34
JLW16-41-07	0.6	0.0669	0.0013	1.2690	0.0233	0.1381	0.0018	0.0539	0.0020	0.7013	835	41	832	10	834	10	1062	38
JLW16-41-08	0.9	0.0655	0.0009	1.1857	0.0215	0.1314	0.0017	0.0512	0.0018	0.7052	791	27	794	10	796	10	1009	34
JLW16-41-09	0.7	0.0669	0.0011	1.2042	0.0261	0.1307	0.0022	0.0558	0.0021	0.7885	835	-165	803	12	792	13	1097	41
JLW16-41-10	0.6	0.0655	0.0010	1.2001	0.0239	0.1329	0.0019	0.0517	0.0019	0.7122	791	27	801	11	805	11	1018	36
JLW16-41-11	1.1	0.0654	0.0012	1.1895	0.0242	0.1320	0.0017	0.0495	0.0017	0.6471	787	39	796	11	799	10	976	33
JLW16-41-12	0.8	0.0652	0.0011	1.1789	0.0279	0.1308	0.0020	0.0522	0.0020	0.6542	789	37	791	13	793	12	1028	39
JLW16-41-13	0.6	0.0742	0.0011	1.4048	0.0348	0.1367	0.0023	0.0591	0.0023	0.6922	1056	30	891	15	826	13	1161	43
JLW16-41-14	0.7	0.0649	0.0012	1.1826	0.0243	0.1322	0.0021	0.0486	0.0015	0.7893	772	39	793	11	800	12	959	29
JLW16-41-15	0.6	0.0655	0.0009	1.2076	0.0211	0.1335	0.0021	0.0468	0.0013	0.9154	791	29	804	10	808	12	924	25
JLW16-41-16	0.9	0.0640	0.0010	1.2132	0.0233	0.1371	0.0019	0.0489	0.0015	0.7394	740	31	807	11	828	11	965	28
YM18-02(Dike)																		
YM18-02-02	0.8	0.0682	0.0010	1.2771	0.0222	0.1356	0.0015	0.0405	0.0006	0.4994	874	31	836	10	820	9	802	12
YM18-02-03	1.0	0.0953	0.0015	1.2396	0.0185	0.0943	0.0009	0.0354	0.0006	0.2637	1533	28	819	8	581	5	702	11
YM18-02-04	0.9	0.0699	0.0012	0.9708	0.0179	0.1003	0.0009	0.0352	0.0005	0.4923	928	31	689	9	616	6	700	10
YM18-02-05	1.5	0.0644	0.0017	1.1650	0.0300	0.1314	0.0014	0.0413	0.0007	0.1730	754	56	784	14	796	8	818	14
YM18-02-06	1.5	0.0914	0.0029	1.6453	0.0607	0.1290	0.0014	0.0499	0.0015	0.5248	1454	61	988	23	782	8	985	28
YM18-02-07	1.2	0.0653	0.0018	1.2093	0.0353	0.1347	0.0018	0.0442	0.0008	0.2192	785	59	805	16	814	10	875	16
YM18-02-08	1.9	0.0739	0.0022	1.3199	0.0440	0.1291	0.0015	0.0397	0.0007	0.3601	1039	61	854	19	782	9	787	14
YM18-02-09	0.8	0.0662	0.0013	1.1942	0.0246	0.1305	0.0012	0.0411	0.0007	0.4409	813	40	798	11	791	7	815	14
YM18-02-10	1.7	0.0749	0.0020	1.3682	0.0366	0.1329	0.0017	0.0432	0.0008	0.2208	1065	53	875	16	805	10	854	15
YM18-02-11	1.4	0.0710	0.0017	1.3208	0.0358	0.1352	0.0021	0.0433	0.0009	0.4010	967	50	855	16	817	12	857	17
YM18-02-12	1.8	0.0808	0.0023	1.4139	0.0390	0.1276	0.0015	0.0427	0.0007	0.0580	1218	56	895	16	774	8	844	14
YM18-02-13	1.9	0.1598	0.0061	3.0874	0.1473	0.1380	0.0015	0.0585	0.0012	0.5008	2453	65	1430	37	834	9	1149	23
YM18-02-14	1.9	0.0656	0.0015	1.2063	0.0286	0.1334	0.0015	0.0421	0.0006	0.2945	794	48	803	13	807	8	833	12
YM18-02-15	1.8	0.1082	0.0064	2.0665	0.1416	0.1343	0.0015	0.0493	0.0016	0.5565	1770	109	1138	47	812	9	972	30

YM18-02-16	1.9	0.0679	0.0017	1.2016	0.0305	0.1285	0.0013	0.0410	0.0006	0.1719	865	52	801	14	779	7	813	12
YM18-02-17	2.0	0.0668	0.0018	1.1883	0.0348	0.1290	0.0018	0.0404	0.0007	0.3576	831	56	795	16	782	10	800	14
YM18-02-18	0.8	0.1169	0.0017	5.5126	0.0841	0.3422	0.0036	0.1028	0.0016	0.4936	1909	26	1903	13	1897	17	1977	30
YM18-02-19	0.3	0.1412	0.0087	1.7212	0.1338	0.0848	0.0013	0.0990	0.0063	0.6118	2242	107	1016	50	525	8	1907	117
YM18-02-20	1.3	0.0770	0.0028	1.3026	0.0563	0.1208	0.0014	0.0421	0.0008	0.4865	1122	74	847	25	735	8	833	16
YM18-02-21	0.7	0.0559	0.0016	0.2112	0.0067	0.0273	0.0004	0.0094	0.0002	0.3814	450	69	195	6	174	2	189	4
YM18-02-22	1.0	0.0738	0.0012	1.2207	0.0201	0.1196	0.0010	0.0402	0.0005	0.3388	1036	65	810	9	729	6	796	10
YM18-02-23	1.5	0.0753	0.0019	1.4123	0.0366	0.1365	0.0020	0.0452	0.0009	0.3018	1076	46	894	15	825	11	894	17
YM18-02-24	1.5	0.0940	0.0032	1.7180	0.0596	0.1329	0.0014	0.0472	0.0008	0.0700	1509	65	1015	22	804	8	933	16
YM18-02-25	1.6	0.0682	0.0017	1.2323	0.0325	0.1305	0.0012	0.0409	0.0006	0.2669	876	46	815	15	791	7	810	12
YM18-05(MME)																		
YM18-05-01	0.8	0.0650	0.0008	1.2195	0.0173	0.1355	0.0013	0.0426	0.0006	0.6384	774	27	810	8	819	7	843	12
YM18-05-02	0.9	0.0649	0.0008	1.2302	0.0166	0.1369	0.0011	0.0435	0.0005	0.4043	772	28	814	8	827	6	861	10
YM18-05-03	0.7	0.0655	0.0010	1.2143	0.0220	0.1336	0.0014	0.0412	0.0006	0.6081	791	33	807	10	809	8	816	12
YM18-05-04	1.0	0.0649	0.0015	1.1963	0.0270	0.1341	0.0016	0.0400	0.0007	0.1565	769	49	799	13	811	9	792	14
YM18-05-05	0.8	0.0671	0.0012	1.2227	0.0236	0.1319	0.0018	0.0408	0.0008	0.4974	843	37	811	11	799	10	809	15
YM18-05-06	1.1	0.0652	0.0013	1.2195	0.0261	0.1350	0.0015	0.0424	0.0008	0.3360	783	47	810	12	816	9	839	15
YM18-05-07	1.3	0.0641	0.0011	1.1641	0.0225	0.1311	0.0013	0.0398	0.0006	0.4478	743	42	784	11	794	8	788	11
YM18-05-08	0.9	0.0659	0.0010	1.2152	0.0216	0.1330	0.0014	0.0410	0.0007	0.5722	806	32	808	10	805	8	812	13
YM18-05-09	0.8	0.0663	0.0011	1.2156	0.0229	0.1323	0.0015	0.0421	0.0007	0.6163	815	31	808	10	801	9	833	14
YM18-05-10	1.1	0.0637	0.0011	1.1587	0.0207	0.1315	0.0013	0.0401	0.0006	0.4608	731	35	781	10	796	8	794	12
YM18-05-11	1.1	0.0647	0.0011	1.1949	0.0210	0.1333	0.0014	0.0402	0.0006	0.4948	765	234	798	10	807	8	797	11
YM18-05-12	0.7	0.0660	0.0012	1.1956	0.0231	0.1310	0.0015	0.0399	0.0008	0.4224	807	44	799	11	793	9	791	15
YM18-05-13	1.6	0.0651	0.0009	1.2142	0.0174	0.1348	0.0012	0.0435	0.0006	0.5503	776	30	807	8	815	7	860	12
YM18-05-15	1.4	0.0650	0.0013	1.1862	0.0276	0.1318	0.0016	0.0407	0.0008	0.5176	776	43	794	13	798	9	807	16
YM18-05-16	0.5	0.0637	0.0011	1.2100	0.0262	0.1370	0.0019	0.0437	0.0011	0.6690	733	37	805	12	828	11	864	21
YM18-05-17	1.4	0.0704	0.0018	1.2838	0.0380	0.1312	0.0017	0.0431	0.0012	0.5052	940	52	839	17	795	10	853	22
YM18-05-19	0.5	0.0639	0.0011	1.1683	0.0195	0.1323	0.0012	0.0413	0.0008	0.3324	739	36	786	9	801	7	818	15
YM18-05-20	0.7	0.0637	0.0010	1.2218	0.0210	0.1387	0.0016	0.0427	0.0007	0.5609	731	33	811	10	837	9	846	14
YM18-05-21	0.8	0.0621	0.0012	1.1540	0.0233	0.1340	0.0014	0.0410	0.0007	0.5046	680	40	779	11	811	8	813	14

Table S2: The major analysis results of plagioclases, amphiboles and clinopyroxenes for the Yuanmou rocks

Sample No.	Al_2O_3	SiO_2	K_2O	CaO	BaO	FeO	Na_2O	MgO	NiO	MnO	Cr_2O_3	TiO_2	Total	Na value for feldspar	$Molecular formula in Clinopyroxene			&Molecular formula in amphible			T (℃)	P (Gpa)	KD(Fe-Mg)
															FeO*	MgO	CaO	Ca	Fe	Mg			
Feldspars for JLW16-44																							
kpl2	19.03	63.75	15.95	0.021	0.473	0.032	0.677	-	-	0.043	-	0.048	100.025	1.685									
kpl3	20	69.56	0.033	0.088	0.029	0.03	10.99	-	0.013	0.004	-	-	100.742	0.440									
kpl5	19.96	68.66	0.03	0.07	0.007	0.054	10.7	0.013	-	0.011	-	0.013	99.514	0.440									
kpl6	18.84	63.67	15.68	0.035	0.282	0.065	0.974	0.016	-	-	-	0.007	99.556	1.947									
kpl7	18.96	65.6	14.95	0.05	0.242	0.046	0.975	-	-	-	0.009	0.004	100.830	1.947									
kpl8	20.02	68.17	0.021	0.067	0.052	-	11.26	0.011	0.011	-	0.015	-	99.617	0.328									
kpl9	19.77	68.5	0.029	0.109	0.032	0.103	11.14	0.001	-	0.009	0.02	-	99.711	0.538									
kpl10	20.01	69.12	0.03	0.034	0.008	0.033	10.72	0.01	0.02	0.008	0.061	-	100.052	0.175									
kpl1	20.13	70.18	0.073	0.103	-	0.046	9.323	0.002	0.018	-	0.048	0.007	99.924	0.607									
kpl4	19.06	63.97	16.19	0.056	0.436	0.213	0.645	-	-	-	-	-	100.578	4.578									
kpl11	20	68.59	0.018	0.149	0.022	0.022	11.24	0.004	-	-	-	-	100.045	0.727									
Feldspars for JLW16-48																							
pl1	19.47	68.48	0.029	0.146	0.027	-	10.88	-	-	-	-	0.004	99.030	0.736									
pl1-2	17.97	71.65	0.032	0.058	-	0.008	9.277	0.009	0.001	0.025	0.011	0.026	99.061	0.344									
pl2	20.09	68.88	0.013	0.021	0.077	0.014	10.87	0.009	-	0.01	-	0.033	100.007	0.107									
pl3	20	68.02	0.001	0.069	0.059	0.003	11.51	0.012	-	0.001	-	-	99.667	0.330									
pl4	19.85	70.72	0.029	0.067	-	-	9.713	-	0.009	0.013	-	0.023	100.426	0.380									
pl5	20.12	69.38	0.031	0.063	0.013	-	11.01	-	-	0.004	-	0.011	100.624	0.315									
pl6	19.78	70.49	0.046	0.091	-	0.039	10.3	-	-	-	0.014	0.002	100.770	0.486									
pl7	20.06	70.55	0.035	0.185	-	-	9.069	-	0.015	0.024	-	0.012	99.949	1.115									
kfs1	18.36	64.25	16.13	0.034	0.426	0.024	0.131	-	0.037	0.004	0.022	-	99.425	12.543									
kfs2	19.21	63.33	16.29	0.008	0.765	0.024	0.516	-	0.006	-	-	-	100.149	0.849									
kfs3	18.86	64.6	16.82	-	0.522	0.011	0.077	-	0.005	-	0.011	0.018	100.915	0.000									
kfs4	18.95	64.7	16.7	0.003	0.265	0.057	0.113	-	0.002	-	-	-	100.788	1.446									
kfs5	19.04	64.18	16.9	0.008	0.462	0.008	0.151	-	-	-	-	0.026	100.772	2.844									
Feldspars for JLW16-51																							
pl1	26.3	58.58	0.502	8.799	0.042	0.32	5.878	0.046	-	-	0.02	0.004	100.481	45.272									
pl2	27.44	55.85	0.467	8.904	0.03	0.368	5.95	0.031	0.047	0.007	0.015	0.007	99.110	45.264									

kpl-1	26.76	57.57	0.623	7.951	0.101	0.275	6.482	0.028	-	0.037	-	-	99.818	40.400							
kpl-2	28.02	55.52	0.489	9.414	0.044	0.397	5.798	0.053	0.032	0.021	-	0.079	99.862	47.292							
kpl-3	24.45	61.11	1.038	5.472	0.135	0.262	7.612	0.004	0.026	-	-	0.013	100.123	28.431							
kpl-4	25.12	59.47	0.905	6.089	0.121	0.248	7.244	0.016	0.013	-	-	0.037	99.262	31.717							
kpl-5	23.5	62.17	1.107	4.094	-	0.183	8.154	0.011	0.03	-	-	0.009	99.251	21.719							
kpl-6	28.58	54.32	0.405	10.33	0.073	0.445	5.182	0.08	-	-	-	0.052	99.471	52.422							
kpl-7	28.24	55.65	0.446	9.746	0.022	0.352	5.596	0.041	0.017	-	-	0.018	100.126	49.042							
kpl-8	28.11	55.24	0.454	9.752	0.056	0.347	5.5	0.023	0.034	-	-	0.077	99.586	49.490							
kpl-9	28.31	54.67	0.438	9.992	-	0.368	5.469	0.037	0.025	0.019	-	0.048	99.373	50.239							
kpl-10	28.29	54.51	0.452	10.14	0.002	0.418	5.269	0.038	-	-	0.011	0.046	99.172	51.528							
Pyroxene for JLW16-51																					
px1	3.24	53.26	0.015	19.05	-	7.697	0.283	16.37	0.027	0.152	0.223	0.538	100.849		0.235	0.890	0.745				
px2	2.61	52.95	0.012	19.56	-	6.157	0.319	16.79	0.053	0.101	1.359	0.447	100.365		0.188	0.916	0.767				
px3	3.653	52.12	0	19.75	-	6.993	0.279	16.07	0.058	0.107	0.435	0.732	100.192		0.215	0.880	0.777				
px4	3.851	52.5	0	18.82	-	7.244	0.286	16.54	0.058	0.117	0.812	0.69	100.911		0.221	0.899	0.735				
px5	4.123	50.22	0.016	18.63	-	9.102	0.328	15.53	0.088	0.149	0.216	0.873	99.276		0.283	0.862	0.743				
px6	2.872	53.23	0.009	18.32	-	6.723	0.303	17.29	0.023	0.126	1.327	0.459	100.680		0.205	0.939	0.715				
Pyroxene for JLW16-54																					
px1	1.612	53.6	0.011	18.57	-	5.26	0.29	19.15	0	0.089	1.187	0.289	100.058		0.160	1.037	0.723	1196	0.28	0.295	
px2	1.528	53.9	0	17.85	-	5.685	0.265	19.32	-	0.116	1.076	0.278	100.016		0.173	1.047	0.695	1208	0.36	0.297	
px3	1.947	53.32	0	19.99	-	4.964	0.304	18.17	0.022	0.115	1.094	0.34	100.265		0.151	0.984	0.778	1197	0.38	0.298	
px4	3.22	51.46	0	19.44	-	7.091	0.321	16.85	-	0.143	0.323	0.808	99.657		0.218	0.924	0.766	1167	0.28	0.286	
px5	2.622	52.05	0.008	19.29	-	6.834	0.311	17.07	0.024	0.101	0.241	0.532	99.081		0.211	0.940	0.764	1164	0.26	0.287	
px6	2.066	53.13	0	19.13	-	6.621	0.273	17.6	0.023	0.105	0.308	0.489	99.754		0.203	0.962	0.752	1156	0.17	0.285	
Pyroxene for JLW16-57																					
px1	5.754	48.91	0	20.57	-	8.96	0.497	13.36	0.009	0.181	0	1.088	99.322		0.280	0.744	0.823	1181	0.55	0.295	
px2	3.184	51.67	0.004	19.15	-	10.2	0.453	14.83	0.017	0.275	0	0.665	100.442		0.315	0.817	0.759	1188	0.50	0.292	
px2-2	3.198	51.63	0.002	18.67	-	9.85	0.436	14.82	0.011	0.247	0	0.765	99.629		0.307	0.823	0.745	1188	0.50	0.293	
px3	4.878	49.5	0	21.1	-	8.716	0.47	13.86	-	0.148	0.128	0.979	99.769		0.271	0.767	0.840	1172	0.48	0.294	
px4	4.265	49.36	0	19.07	-	10.98	0.452	13.52	-	0.232	0.085	1.182	99.148		0.346	0.759	0.770	1190	0.52	0.294	
px5	4.628	50.95	0.014	18.51	-	8.129	0.518	15.71	0.022	0.153	0.111	0.536	99.274		0.252	0.867	0.734				
px6	3.231	51.24	0	19.44	-	9.086	0.373	15.31	0.067	0.131	0.126	0.708	99.718		0.282	0.847	0.773	1174	0.37	0.289	
px8	4.961	49.44	0.013	20.49	-	8.605	0.443	14.08	0.066	0.096	0.292	1.026	99.515		0.268	0.782	0.818	1176	0.47	0.293	
px9	3.331	51.07	0	19.21	-	8.976	0.428	15.33	-	0.19	0	0.701	99.236		0.279	0.851	0.766	1184	0.47	0.293	

pxh1	5.836	48.46	0	19.27	-	10.02	0.668	13.05	-	0.217	0.04	1.223	98.776	0.315	0.732	0.777					
pxh2	5.353	49.14	0	20.22	-	9.048	0.541	13.71	-	0.118	0.034	1.001	99.164	0.283	0.764	0.809				1191	0.61	0.297
pxh3	6.594	47.74	0	20.24	-	9.821	0.516	12.75	0.031	0.103	0.015	1.392	99.196	0.308	0.713	0.814					
pxh4	3.168	51.2	0.001	19.88	-	9.282	0.439	15.04	0.024	0.168	0.045	0.654	99.904	0.288	0.831	0.789				1180	0.46	0.293
pxh5	3.233	50.69	0	20.25	-	8.888	0.353	14.99	0.017	0.145	0.079	0.658	99.298	0.277	0.833	0.808				1162	0.31	0.289
pxh6	3.563	51.02	0.016	19.88	-	9.087	0.492	14.87	-	0.16	0.023	0.742	99.848	0.282	0.821	0.789					
pxh7	3.984	50.34	0	20.08	-	9.412	0.476	14.74	0.011	0.227	0.039	0.843	100.154	0.291	0.813	0.795					
pxh8	4.24	50.14	0	20.27	-	8.995	0.466	14.18	-	0.159	0.015	0.913	99.378	0.281	0.789	0.810				1179	0.50	0.294
Pyroxene for JLW16-58																						
px1	3.88	51.73	0	18.59	-	7.174	0.28	16.34	0.024	0.121	0.656	0.803	99.596	0.221	0.899	0.735				1134	0.25	0.283
px2	4.599	50.97	0	19.95	-	7.391	0.34	15.37	-	0.103	0.417	0.766	99.902	0.228	0.844	0.788				1134	0.33	0.288
px3	4.849	50.45	0.005	19.5	-	7.121	0.307	15.3	-	0.146	0.374	1.053	99.107	0.221	0.848	0.776					
px3-2	3.433	51.58	0	20.17	-	6.036	0.304	16.55	0.006	0.124	1.248	0.567	100.021	0.185	0.905	0.793				1126	0.24	0.286
px4	4.304	51.81	0.002	19.39	-	7.701	0.284	15.77	0.077	0.113	0.732	0.747	100.924	0.235	0.859	0.760					
px5	3.598	52.31	0.008	20.28	-	5.422	0.354	16.04	-	0.107	1.173	0.617	99.902	0.167	0.878	0.798					
px6	6.933	48.71	0.011	19.97	-	9.742	0.393	13.04	-	0.143	0	1.349	100.290	0.302	0.721	0.794					
px7	4.399	51.47	0.005	19.93	-	7.328	0.331	15.83	0.048	0.089	0.574	0.661	100.662	0.224	0.863	0.781					
px7-2	3.588	52.87	0.005	20.28	-	6.76	0.306	16.13	0.019	0.123	0.824	0.503	101.401	0.205	0.872	0.788					
Amphibole for JLW16-51																						
amp1	11.31	43.67	0.809	11.07	-	14.14	2.11	11.86	-	0.125	-	1.863	96.968				1.761	1.706	2.625	888		
amp2	11.78	43.4	0.817	10.82	-	14.46	2.153	11.97	-	0.155	0.044	1.699	97.298				1.712	1.704	2.636	896		
amp3	12.18	42.47	0.936	11.04	-	14.12	2.177	11.87	-	0.188	-	2.024	97.004				1.758	1.695	2.630	915		
amp4	11.61	43.61	0.864	11.26	-	14.17	2.084	12.15	0.013	0.251	-	1.837	97.845				1.776	1.697	2.667	895		
amp5	11.84	43.03	0.826	10.99	-	13.65	2.24	12.33	-	0.155	-	2.031	97.097				1.743	1.624	2.720	915		
amp6	12.2	42.87	0.886	11	-	13.07	2.147	12.33	0.067	0.188	-	2.259	97.019				1.744	1.563	2.720	923		
amp7	12.18	42.84	0.734	10.6	-	12.47	2.309	13.17	0.048	0.099	0.008	2.219	96.667				1.672	1.434	2.892	939		
amp8	11.93	43.04	0.803	10.81	-	14.65	2.168	11.7	-	0.217	-	1.795	97.101				1.717	1.746	2.586	899		
amp9	12.25	42.57	0.864	10.86	-	13.17	2.193	12.62	0.04	0.158	0.004	2.08	96.806				1.722	1.546	2.784	928		
Amphibole for JLW16-57																						
amp1	12.38	41.71	0.963	10.45	-	13.9	2.56	11.74	0.004	0.18	0.008	2.66	96.557				1.673	1.671	2.616	948		
amp2	11.98	42.86	0.965	10.61	-	13.42	2.569	12.23	0.027	0.179	-	2.717	97.550				1.677	1.605	2.689	940		
amp3	12.19	42.18	0.95	10.51	-	15.03	2.482	11.21	-	0.171	-	2.615	97.335				1.676	1.806	2.486	929		
amp4	12.28	42.42	0.982	10.38	-	14.75	2.492	12.01	-	0.216	-	2.379	97.907				1.638	1.720	2.637	935		
amp5	11.57	42.64	0.922	10.77	-	13.2	2.53	12.42	0.012	0.152	-	2.781	96.991				1.712	1.589	2.749	941		
amp6	11.35	42.52	0.948	10.47	-	15.5	2.57	10.72	0.052	0.158	0.008	2.744	97.042				1.682	1.905	2.398	914		

amp7	12.1	42.16	1.026	10.55	-	14.22	2.527	11.7	0.014	0.192	-	2.847	97.329		1.679	1.710	2.591	942
amp8	11.69	42.92	1.017	10.57	-	13.91	2.503	12.32	-	0.168	0.021	2.074	97.179		1.677	1.648	2.720	923
amp9	11.81	42.38	1.019	10.25	-	13.43	2.566	12.39	-	0.171	0.069	2.706	96.786		1.631	1.585	2.743	946
Amphibole for JLW16-58																		
amp1	11.85	43.01	0.724	10.9	-	13.63	2.19	12.8	-	0.159	0.017	1.572	96.854		1.726	1.583	2.820	912
amp2	11.46	43.56	0.777	10.99	-	14.64	2.162	11.91	-	0.217	0.029	1.893	97.646		1.738	1.743	2.621	894
amp3	10.72	44.06	0.664	10.82	-	14.71	2.033	12.05	0.048	0.254	-	1.858	97.219		1.714	1.751	2.658	878
amp4	11.71	43.28	0.749	10.65	-	15.46	2.123	11.09	-	0.2	0.021	2.069	97.346		1.692	1.848	2.451	890
amp5	11.94	43.18	0.766	10.61	-	12.55	2.307	12.94	-	0.181	0.063	1.924	96.456		1.680	1.467	2.850	924
amp5-2	11.82	43.44	0.73	10.58	-	13.62	2.236	12.99	-	0.213	-	1.662	97.282		1.663	1.560	2.841	913
amp6	11.91	43.21	0.794	10.88	-	14.28	2.209	12.24	-	0.205	-	1.916	97.638		1.716	1.678	2.685	909
amp7	11.15	43.36	0.77	10.89	-	13.44	2.151	12.12	0.004	0.212	0.006	2.04	96.152		1.742	1.636	2.698	898
amp8	12.43	42.92	0.802	10.82	-	12.9	2.305	12.82	-	0.189	-	1.687	96.859		1.708	1.507	2.818	925

Note : [$]Cationic coefficient calculated with cation number of 4. The calculation is used by the price difference method.

[&]Cationic coefficient calculated with cation number of 6. The specific calculation method referenced by Leak et al., (1997).

Table S3: The geochemistry analysis results for the Neoproterozoic adakitic and mafic pluton in the western margin of the Yangtze Block

Location	Yaunmou pluton								Dajianshan pluton						
Sample	JLW16-41	JLW16-42	JLW16-43	JLW16-44	JWL16-45	JLW16-48	JLW16-49	JWL16-50	DJS-2–1	DJS-2–2	DJS-2–3	DJS-2–4	DJS-2–5	DJS-2–6	DJS-2–7
Rock type	Adakitic rock								Adakitic rock						
Reference	This study								Zhu Yu et al., 2019						
Age(Ma)	811								800						
Major(wt.%)															
SiO_2	63.39	65.80	66.65	67.46	66.05	66.47	62.78	65.84	74.62	74.73	74.08	74.60	74.82	74.32	74.46
TiO_2	0.45	0.48	0.45	0.38	0.48	0.50	0.58	0.49	0.10	0.11	0.09	0.10	0.11	0.10	0.13
Al_2O_3	13.14	15.94	15.95	15.17	16.25	14.63	16.77	15.91	13.85	14.32	14.70	14.52	13.97	14.25	14.11
Fe2O3T	3.32	3.77	3.33	2.94	3.74	3.64	4.78	3.86	1.04	1.10	0.86	1.12	1.08	0.98	1.16
Fe_2O_3															
FeO															
MnO	0.09	0.08	0.08	0.07	0.08	0.07	0.11	0.09	0.04	0.05	0.03	0.04	0.04	0.04	0.05
MgO	1.28	1.23	1.30	1.11	1.26	1.48	1.66	1.56	0.28	0.29	0.25	0.27	0.29	0.29	0.30
CaO	6.65	3.50	2.69	1.98	3.51	2.23	2.89	2.34	1.49	1.66	1.79	1.41	1.48	1.50	1.53
Na_2O	4.88	4.89	4.96	5.76	4.93	6.22	5.23	4.76	4.76	5.16	5.06	5.50	5.60	5.07	4.92
K_2O	1.76	1.85	1.88	2.43	1.82	1.35	2.49	2.08	2.39	1.82	2.31	1.13	1.04	2.36	2.19
P_2O_5	0.14	0.16	0.15	0.14	0.16	0.17	0.19	0.16	0.04	0.09	0.03	0.04	0.04	0.04	0.05
LOI	5.25	1.33	1.62	1.73	0.53	1.74	1.71	1.89	1.06	0.84	1.06	0.97	1.15	0.85	0.84
TOL	100.33	99.03	99.04	99.17	98.79	98.49	99.19	98.97	99.67	100.17	100.26	99.70	99.62	99.80	99.74
Trace(ppm)															
Li	14.0	14.7	14.5	14.8	10.8	15.1	15.8	18.0	4.85	4.64	3.91	4.90	4.83	4.52	5.46
Be	1.75	2.03	1.73	2.06	2.21	1.18	2.26	2.18	1.65	1.83	1.74	1.57	1.60	1.71	1.82
Sc	6.13	6.92	5.90	5.39	7.02	5.54	8.76	5.34	2.14	2.03	1.64	1.94	2.06	2.04	2.30
V	78.1	86.4	85.1	79.8	93.7	75.1	124	102	5.30	5.12	4.25	5.24	5.26	4.96	5.91
Cr	126	147	138	138	143	138	143	141	3.52	3.36	2.94	3.00	3.27	3.16	3.59
Co															
Ni	3.20	13.5	11.5	11.0	12.1	7.42	8.76	8.85	1.39	1.55	1.36	1.32	1.46	1.35	1.53
Cu	2.52	2.88	2.84	1.85	2.96	2.45	24.8	13.5	2.73	2.07	1.83	2.43	2.68	2.25	3.36
Zn	86.4	62.6	60.4	50.7	69.2	49.7	82.7	76.7	28.2	25.3	21.7	24.3	25.8	25.9	31.5

Table S3: The geochemistry analysis results for the Neoproterozoic adakitic and mafic pluton in the western margin of the Yangtze Block

Location	Yaunmou pluton								Dajianshan pluton						
Sample	JLW16-41	JLW16-42	JLW16-43	JLW16-44	JWL16-45	JLW16-48	JLW16-49	JWL16-50	DJS-2–1	DJS-2–2	DJS-2–3	DJS-2–4	DJS-2–5	DJS-2–6	DJS-2–7
Rock type	Adakitic rock								Adakitic rock						
Reference	This study								Zhu Yu et al., 2019						
Age(Ma)	811								800						
Ga	15.6	18.9	19.4	16.2	20.4	12.9	21.2	19.5	12.9	13.8	13.3	13.6	13.2	13.4	14.0
Ge															
Rb	25.4	20.0	21.4	34.8	28.3	20.7	32.8	35.9	29.9	26.4	28.6	20.5	19.0	30.0	30.2
Sr	208	338	335	194	327	141	354	399	347	395	382	341	335	371	378
Y	9.41	7.10	6.83	7.37	8.66	8.13	16.1	9.25	8.26	8.62	7.04	7.13	7.90	7.97	9.71
Zr	224	226	216	241	247	192	250	247	99.0	98.5	88.0	90.0	93.9	90.3	105
Nb	6.42	4.86	5.11	5.18	5.27	3.76	8.34	5.26	4.69	5.61	3.84	4.36	4.52	4.32	5.79
Sn															
Cs	0.73	1.07	0.84	0.93	0.86	0.70	0.85	1.65	0.27	0.28	0.24	0.22	0.22	0.24	0.28
Ba	447	535	567	1020	646	349	969	602	1730	1270	1510	572	456	1590	1550
La	46.2	54.0	45.4	51.9	32.2	45.1	41.5	46.7	14.0	17.5	14.5	16.2	15.9	17.6	16.2
Ce	88.0	89.6	77.2	90.4	60.2	70.5	73.0	73.7	26.0	32.6	26.4	30.0	29.6	32.6	30.7
Pr	8.45	8.89	7.70	8.90	6.32	6.95	8.02	7.27	2.71	3.39	2.74	3.12	3.11	3.41	3.21
Nd	27.8	27.6	24.0	27.8	23.2	22.1	27.6	23.2	9.47	11.8	9.54	10.9	10.8	11.9	11.2
Sm	3.80	2.98	2.89	3.33	3.32	2.72	4.24	2.91	1.59	1.94	1.55	1.76	1.78	1.95	1.87
Eu	0.94	0.94	0.89	0.99	1.15	0.89	1.04	0.80	0.66	0.71	0.68	0.62	0.58	0.71	0.69
Gd	4.01	3.27	2.87	3.43	3.38	2.85	4.28	3.02	1.45	1.69	1.38	1.49	1.53	1.65	1.68
Tb	0.46	0.37	0.31	0.37	0.43	0.31	0.58	0.37	0.21	0.25	0.19	0.21	0.22	0.23	0.25
Dy	2.45	1.70	1.55	1.77	2.13	1.66	3.26	1.82	1.32	1.47	1.17	1.21	1.32	1.34	1.56
Ho	0.39	0.30	0.25	0.29	0.35	0.28	0.62	0.34	0.28	0.30	0.24	0.25	0.27	0.27	0.33
Er	1.20	0.89	0.82	0.95	1.09	0.95	1.86	1.16	0.83	0.88	0.72	0.73	0.81	0.81	0.99
Tm	0.17	0.13	0.12	0.13	0.14	0.15	0.28	0.14	0.13	0.14	0.11	0.11	0.12	0.13	0.16
Yb	1.18	0.74	0.81	0.90	0.92	1.00	1.82	1.20	0.92	0.95	0.78	0.81	0.88	0.87	1.08
Lu	0.19	0.15	0.13	0.15	0.18	0.16	0.28	0.19	0.14	0.15	0.12	0.13	0.14	0.14	0.17
Hf	5.94	6.58	6.25	6.70	6.70	5.11	6.52	6.56	2.52	2.47	2.21	2.29	2.35	2.29	2.65
Ta	0.34	0.43	0.42	0.42	0.46	0.30	0.68	0.47	0.60	0.71	0.54	0.56	0.59	0.58	0.71

Table S3: The geochemistry analysis results for the Neoproterozoic adakitic and mafic pluton in the western margin of the Yangtze Block

Location	Yaunmou pluton								Dajianshan pluton						
Sample	JLW16-41	JLW16-42	JLW16-43	JLW16-44	JWL16-45	JLW16-48	JLW16-49	JWL16-50	DJS-2–1	DJS-2–2	DJS-2–3	DJS-2–4	DJS-2–5	DJS-2–6	DJS-2–7
Rock type	Adakitic rock								Adakitic rock						
Reference	This study								Zhu Yu et al., 2019						
Age(Ma)	811								800						
Pb	8.71	7.60	7.18	7.42	8.59	4.61	16.5	12.7	25.5	13.0	14.8	8.75	11.6	15.9	15.9
Th	9.28	8.75	7.56	7.71	5.13	6.41	6.17	7.80	1.91	2.30	1.64	2.07	2.09	2.24	2.15
U	1.22	0.86	0.91	1.02	1.09	0.72	1.10	1.10	0.32	0.40	0.30	0.30	0.30	0.36	0.32
Isotopic date															
$^{87}Sr/^{86}Sr$ (t)															
$\varepsilon_{Nd\ (t)}$															
Ratio															
Mg#	47.3	43.2	47.6	46.7	44.0	48.7	44.7	48.5	38.6	38.1	40.4	36.0	38.5	40.8	37.6
Sr/Y	22.1	47.6	49.0	26.3	37.7	17.4	21.9	43.2	42.0	45.9	54.3	47.9	42.4	46.6	38.9
Nb/La	0.14	0.09	0.11	0.10	0.16	0.08	0.20	0.11	0.33	0.32	0.27	0.27	0.28	0.25	0.36
Nb/U	5.28	5.64	5.63	5.09	4.83	5.25	7.61	4.76	14.7	14.0	12.8	14.5	15.1	12.0	18.1

Table S3: Continuted

Location	Mopanshan pluton															
Sample	MPS05-1	MPS05-2	MPS05-3	MPS05-4	MPS05-5	MPS05-6	MPS06-6	MPS06-14	MPS06-15	MPS06-16	MPS06-17	MPS06-19	MPS06-8	MPS06-9	MPS06-10	MPS06-11
Rock type	Adakitic rock															
Reference	Huang et al., 2009															
Age(Ma)			782													
Major(wt.%)																
SiO_2	65.26	65.24	65.83	65.33	66.07	65.23	65.55	68.86	68.34	68.55	68.86	63.92	67.97	67.92	69.69	66.51
TiO_2	0.60	0.60	0.51	0.51	0.48	0.57	0.50	0.32	0.34	0.32	0.35	0.55	0.39	0.39	0.32	0.44
Al_2O_3	17.06	17.07	16.65	16.75	16.65	16.84	16.69	16.25	16.32	16.03	16.03	16.94	16.02	16.09	15.84	16.57
Fe2O3T	3.74	3.73	3.54	3.32	3.98	3.67	3.75	2.90	2.88	3.09	2.81	4.47	2.88	2.99	2.93	3.59
Fe_2O_3																
FeO																
MnO	0.06	0.05	0.05	0.05	0.05	0.05	0.06	0.05	0.11	0.05	0.06	0.07	0.06	0.05	0.06	0.05
MgO	1.75	1.79	1.55	1.24	1.75	1.69	1.55	1.08	1.13	0.92	1.06	2.14	1.19	1.18	0.88	1.25
CaO	3.78	3.20	4.27	5.45	4.41	2.89	4.24	4.00	3.98	3.69	3.49	4.54	3.52	3.60	3.45	4.09
Na_2O	3.87	4.07	3.73	3.79	3.85	4.22	4.00	4.13	4.04	4.02	3.97	4.03	3.96	3.86	3.86	3.89
K_2O	2.12	2.23	2.31	1.90	1.93	2.47	2.40	1.56	1.66	2.06	2.42	2.14	2.73	2.69	2.37	2.34
P_2O_5	0.16	0.16	0.13	0.13	0.14	0.16	0.13	0.12	0.12	0.12	0.11	0.15	0.11	0.12	0.11	0.13
LOI	1.56	1.88	0.85	1.51	0.99	1.87	0.96	0.71	0.71	0.50	1.06	1.55	1.29	0.78	0.61	0.60
TOL	99.95	100.02	99.42	99.97	97.37	99.67	99.83	99.97	99.61	99.33	100.20	100.49	100.12	99.67	100.12	99.46
Trace(ppm)																
Li																
Be																
Sc																
V																
Cr	21.0	15.8	15.9	16.5	31.1	13.7	22.9	10.8	8.99	6.27	8.02	27.3	22.7	19.0	5.21	11.9
Co																
Ni	7.65	6.02	4.87	5.56	11.6	4.37	11.5	3.41	3.12	1.64	1.69	11.0	8.01	5.08	2.20	3.63
Cu																
Zn																

Table S3: Continuted

Location	Mopanshan pluton															
Sample	MPS05-1	MPS05-2	MPS05-3	MPS05-4	MPS05-5	MPS05-6	MPS06-6	MPS06-14	MPS06-15	MPS06-16	MPS06-17	MPS06-19	MPS06-8	MPS06-9	MPS06-10	MPS06-11
Rock type	Adakitic rock															
Reference	Huang et al., 2009															
Age(Ma)			782													
Ga	19.8	20.5	20.8	20.0	19.6	19.9	19.3	18.3	19.9	19.2	18.7	21.6	19.1	18.4	18.3	20.6
Ge																
Rb	50.8	61.6	70.8	63.5	66.0	57.3	58.4	35.7	56.0	51.3	50.3	57.2	71.5	68.2	59.8	64.4
Sr	422	422	383	454	577	419	362	322	319	319	316	482	348	311	314	325
Y	10.8	10.6	11.3	6.06	8.96	9.79	9.93	7.64	8.18	9.33	9.34	12.8	10.8	16.6	10.1	13.0
Zr	161	163	195	143	165	184	166	117	123	128	135	133	172	136	157	75.9
Nb	4.72	4.53	4.53	3.56	4.80	4.46	4.34	3.21	3.40	4.01	3.94	5.11	5.62	5.58	4.33	5.11
Sn																
Cs																
Ba	652	651	693	553	624	745	736	562	525	693	688	703	651	719	920	714
La	28.9	25.4	32.3	35.4	27.8	28.5	23.1	19.5	21.4	35.3	39.1	44.1	33.8	25.8	30.4	34.2
Ce	55.3	50.7	62.2	65.5	50.4	56.6	47.2	39.3	42.4	68.6	76.3	84.6	65.6	52.1	60.0	67.4
Pr	6.58	6.27	7.38	7.25	5.59	6.70	5.64	4.57	5.00	7.66	8.41	9.17	7.24	6.30	6.64	7.63
Nd	24.0	22.8	25.8	23.6	19.0	24.2	20.9	16.5	17.9	26.2	28.5	30.8	24.3	23.8	22.8	26.9
Sm	3.95	3.85	4.05	3.03	3.05	4.03	3.60	2.69	3.01	3.82	4.06	4.77	3.66	4.95	3.53	4.33
Eu	1.02	1.07	0.99	0.91	0.78	1.10	0.92	0.85	0.89	0.88	0.89	1.04	0.82	0.98	0.83	0.96
Gd	3.07	3.04	3.07	2.04	1.92	3.11	2.89	2.17	2.29	2.83	3.08	3.87	2.96	4.26	2.77	3.45
Tb	0.43	0.41	0.44	0.25	0.31	0.40	0.40	0.29	0.32	0.36	0.38	0.50	0.37	0.67	0.37	0.48
Dy	2.22	2.18	2.29	1.20	1.51	2.04	2.05	1.58	1.71	1.89	1.95	2.65	2.02	3.61	2.01	2.57
Ho	0.40	0.40	0.43	0.22	0.32	0.40	0.40	0.32	0.33	0.38	0.40	0.52	0.40	0.70	0.41	0.51
Er	1.08	1.05	1.16	0.63	0.85	1.00	1.01	0.83	0.85	1.00	1.00	1.35	1.09	1.72	1.07	1.33
Tm	0.14	0.14	0.15	0.08	0.12	0.14	0.14	0.12	0.13	0.15	0.15	0.20	0.17	0.25	0.16	0.20
Yb	0.87	0.85	1.02	0.54	0.80	0.92	0.91	0.76	0.80	1.01	1.02	1.29	1.13	1.46	1.03	1.21
Lu	0.13	0.13	0.16	0.09	0.13	0.14	0.15	0.12	0.13	0.16	0.18	0.20	0.19	0.20	0.16	0.19
Hf	4.38	4.53	5.76	3.93	3.72	4.81	4.28	3.22	3.46	3.63	3.98	3.83	4.93	3.68	4.22	2.33
Ta	0.33	0.29	0.32	0.18	0.24	0.31	0.29	0.22	0.25	0.31	0.32	0.38	0.48	0.57	0.27	0.40

Table S3: Continuted

Location	Mopanshan pluton															
Sample	**MPS05-1**	**MPS05-2**	**MPS05-3**	**MPS05-4**	**MPS05-5**	**MPS05-6**	**MPS06-6**	**MPS06-14**	**MPS06-15**	**MPS06-16**	**MPS06-17**	**MPS06-19**	**MPS06-8**	**MPS06-9**	**MPS06-10**	**MPS06-11**
Rock type	Adakitic rock															
Reference	Huang et al., 2009															
Age(Ma)			782													
Pb	10.4	8.62	10.2	7.02	12.3	11.5	10.1	5.30	5.60	10.9	10.6	15.1	14.4	11.4	12.4	11.1
Th	4.65	4.41	6.01	6.18	5.87	5.74	5.51	3.90	4.15	7.05	8.12	9.79	10.3	6.46	6.47	7.46
U	0.76	0.85	1.10	0.98	0.98	0.97	0.99	0.57	0.62	0.88	0.91	1.34	1.78	0.68	0.47	1.30
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)	0.704957		0.704275	0.705447	0.705649											
$\varepsilon_{Nd\ (t)}$	-0.54		-2.06	-0.43	-1.92											
Ratio																
Mg#	52.2	52.8	50.5	46.5	50.6	51.8	49.1	46.5	47.8	41.0	46.8	52.7	49.1	47.9	41.2	44.8
Sr/Y	39.1	39.8	33.9	74.9	64.4	42.8	36.5	42.1	39.0	34.2	33.8	37.7	32.2	18.7	31.1	25.0
Nb/La	0.16	0.18	0.14	0.10	0.17	0.16	0.19	0.16	0.16	0.11	0.10	0.12	0.17	0.22	0.14	0.15
Nb/U	6.21	5.33	4.12	3.63	4.90	4.60	4.38	5.63	5.48	4.56	4.33	3.81	3.16	8.21	9.21	3.93

Table S3: Continuted

Location																
Sample	**DT-02**	**DT-04**	**DT-05**	**DT-06**	**DT-07**	**DT-08**	**DT-09**	**DT-10**	**DT-12**	**DT-13**	**DT-14**	**DT-15**	**DT-16**	**DT-18**	**DT-19**	**DT-20**
Rock type																
Reference																
Age(Ma)																
Major(wt.%)																
SiO_2	65.50	64.21	65.25	62.63	62.50	62.44	63.28	62.84	63.98	62.84	62.08	62.75	62.60	63.76	62.87	61.32
TiO_2	0.37	0.40	0.40	0.45	0.48	0.47	0.47	0.49	0.44	0.47	0.49	0.47	0.46	0.47	0.48	0.53
Al_2O_3	16.69	16.97	16.79	17.34	17.16	17.20	17.04	16.92	17.30	17.52	17.48	16.97	17.15	16.52	17.27	17.17
Fe2O3T	3.26	3.58	3.44	4.13	4.38	4.14	4.15	4.49	3.75	4.18	4.27	4.07	4.02	4.07	4.14	4.80
Fe_2O_3																
FeO																
MnO	0.05	0.06	0.06	0.07	0.07	0.06	0.06	0.07	0.05	0.07	0.07	0.06	0.06	0.07	0.06	0.07
MgO	1.55	1.61	1.60	1.96	2.18	2.11	1.96	2.11	1.71	1.99	2.12	2.08	2.10	2.13	2.17	2.60
CaO	4.15	4.40	4.29	4.78	5.13	4.99	4.64	4.77	4.60	4.81	5.11	4.88	5.09	4.87	5.18	5.34
Na_2O	4.04	4.14	4.25	4.15	4.05	4.00	3.98	3.98	4.05	4.18	4.18	3.94	4.06	3.85	3.98	3.46
K_2O	2.14	2.15	1.89	2.08	1.79	2.05	2.18	2.04	2.20	1.79	1.88	2.27	1.91	2.09	1.85	2.17
P_2O_5	0.11	0.13	0.13	0.14	0.14	0.14	0.14	0.15	0.14	0.15	0.15	0.14	0.14	0.12	0.14	0.16
LOI	1.09	1.19	1.03	0.91	1.04	1.03	0.97	1.01	0.87	0.84	0.94	1.07	1.07	1.02	0.90	1.03
TOL	98.96	98.83	99.13	98.62	98.91	98.64	98.87	98.87	99.09	98.84	98.76	98.69	98.67	98.98	99.04	98.67
Trace(ppm)																
Li																
Be																
Sc	9.30	10.3	9.02	10.8	11.4	10.5	10.0	10.4	8.63	9.10	10.2	9.41	10.3	10.4	11.0	13.9
V	47.6	51.0	49.1	63.5	71.9	66.5	62.0	65.5	54.3	59.3	60.5	59.8	59.5	64.7	69.0	83.2
Cr	19.3	21.5	17.7	26.3	30.6	28.1	25.3	28.6	17.9	20.0	25.6	25.5	25.9	32.8	31.5	37.4
Co																
Ni	12.1	14.1	10.2	13.9	16.5	16.8	12.5	14.4	10.1	11.8	14.4	14.9	15.4	16.7	16.4	20.3
Cu																
Zn																

Table S3: Continuted

Location																
Sample	**DT-02**	**DT-04**	**DT-05**	**DT-06**	**DT-07**	**DT-08**	**DT-09**	**DT-10**	**DT-12**	**DT-13**	**DT-14**	**DT-15**	**DT-16**	**DT-18**	**DT-19**	**DT-20**
Rock type																
Reference																
Age(Ma)																
Ga																
Ge																
Rb	85.1	72.8	74.1	78.8	73.8	79.0	71.8	74.1	74.4	91.8	72.0	75.9	66.9	80.2	73.8	74.9
Sr	493	572	545	568	550	573	575	555	533	503	550	533	552	494	542	531
Y	7.05	7.76	7.10	9.41	11.4	9.78	8.23	9.85	7.28	7.73	9.49	9.72	9.61	9.89	12.3	12.2
Zr	159	139	124	147	130	148	139	164	135	160	159	144	129	124	128	136
Nb	5.08	4.15	4.67	5.16	5.12	5.24	4.13	4.83	4.72	5.59	5.07	4.80	4.88	6.93	5.52	5.50
Sn																
Cs	6.55	3.18	2.96	3.07	2.87	3.00	2.34	2.83	2.84	3.92	2.85	2.66	2.27	3.18	2.36	2.77
Ba	654	893	620	543	328	408	773	582	677	386	341	795	592	397	614	686
La	15.8	25.3	17.7	5.32	26.2	10.1	9.10	15.9	23.6	15.3	19.3	26.1	6.23	4.90	5.98	8.60
Ce	31.2	48.9	33.0	9.19	50.9	20.8	18.0	31.7	45.1	29.1	38.8	48.5	13.9	11.0	13.9	20.1
Pr	3.59	5.33	3.55	1.46	5.74	2.66	2.24	3.64	4.76	3.20	4.46	5.16	2.08	1.68	2.07	2.86
Nd	13.4	19.2	12.7	7.19	20.6	11.2	9.46	14.7	16.7	12.3	17.2	18.6	9.80	8.40	10.1	13.3
Sm	2.70	3.23	2.42	2.25	3.61	2.51	2.33	3.12	2.79	2.46	3.28	3.34	2.59	2.37	2.80	3.24
Eu	0.72	0.78	0.78	0.75	0.85	0.75	0.79	0.86	0.81	0.70	0.81	0.79	0.76	0.68	0.77	0.82
Gd	2.00	2.31	1.97	2.21	2.64	2.29	2.19	2.65	1.99	2.04	2.49	2.49	2.37	2.22	2.72	2.85
Tb	0.29	0.33	0.27	0.32	0.43	0.33	0.31	0.38	0.30	0.31	0.38	0.38	0.34	0.33	0.40	0.44
Dy	1.38	1.56	1.33	1.70	2.07	1.77	1.62	1.99	1.47	1.51	1.94	1.91	1.89	1.88	2.19	2.31
Ho	0.26	0.28	0.24	0.32	0.40	0.34	0.30	0.38	0.27	0.28	0.35	0.36	0.35	0.36	0.44	0.43
Er	0.75	0.82	0.71	0.93	1.20	0.98	0.85	1.04	0.79	0.85	1.04	1.04	1.06	1.05	1.27	1.29
Tm	0.10	0.11	0.09	0.13	0.19	0.14	0.12	0.14	0.11	0.12	0.15	0.15	0.14	0.15	0.18	0.18
Yb	0.74	0.71	0.67	0.91	1.01	0.94	0.76	0.95	0.77	0.77	0.94	0.98	0.96	1.08	1.21	1.15
Lu	0.12	0.11	0.10	0.14	0.17	0.14	0.11	0.13	0.12	0.12	0.15	0.15	0.14	0.16	0.18	0.16
Hf	4.61	3.72	3.48	3.95	3.40	3.87	3.76	4.49	4.01	4.46	4.41	4.11	3.79	3.63	3.68	3.85
Ta	0.50	0.27	0.31	0.55	0.31	0.32	0.26	0.32	0.33	0.29	0.32	0.30	0.36	0.69	0.44	0.31

Table S3: Continuted

Location																
Sample	**DT-02**	**DT-04**	**DT-05**	**DT-06**	**DT-07**	**DT-08**	**DT-09**	**DT-10**	**DT-12**	**DT-13**	**DT-14**	**DT-15**	**DT-16**	**DT-18**	**DT-19**	**DT-20**
Rock type																
Reference																
Age(Ma)																
Pb	15.4	14.1	12.7	12.5	10.6	12.0	12.1	12.8	14.4	13.0	12.3	13.2	11.9	14.8	13.0	11.2
Th	14.7	9.44	5.29	1.36	8.40	4.08	3.45	6.81	8.99	5.23	9.05	9.13	1.33	1.00	1.47	1.91
U	2.38	3.24	2.33	1.61	1.28	2.22	1.23	1.77	1.52	1.17	1.78	1.67	1.03	1.73	0.96	1.08
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)								0.704308				0.705068				
$\varepsilon_{Nd\ (t)}$								-0.49				-0.44				
Ratio																
Mg#	52.6	51.2	52.0	52.5	53.8	54.4	52.4	52.2	51.6	52.6	53.6	54.4	54.9	54.9	54.9	55.8
Sr/Y	70.0	73.6	76.7	60.4	48.0	58.6	69.9	56.3	73.2	65.1	57.9	54.8	57.4	50.0	44.1	43.3
Nb/La	0.32	0.16	0.26	0.97	0.20	0.52	0.45	0.30	0.20	0.37	0.26	0.18	0.78	1.41	0.92	0.64
Nb/U	2.13	1.28	2.00	3.21	4.01	2.36	3.36	2.73	3.12	4.78	2.84	2.87	4.76	4.00	5.74	5.09

Table S3: Continuted

Location	Datian pluton															
Sample	**DT-21**	**DT-22**	**DT-23**	**DT-24**	**DT-25**	**DT-27**	**DT-28**	**DT-29**	**DT-30**	**DT-31**	**DT-32**	**DT-33**	**DT-34**	**DT-35**	**DT-36**	**DT-37**
Rock type	**Alkaine mafic rock**															
Reference	**Zhao and Zhou, 2007**															
Age(Ma)								**760**								
Major(wt.%)																
SiO_2	62.78	64.11	62.01	61.92	61.92	61.58	62.21	62.99	60.83	61.36	61.01	61.56	63.06	62.07	61.56	62.43
TiO_2	0.47	0.40	0.56	0.56	0.55	0.46	0.50	0.49	0.57	0.52	0.63	0.55	0.46	0.54	0.54	0.52
Al_2O_3	17.33	16.94	16.92	16.88	17.24	17.44	17.36	16.75	17.49	17.31	16.54	17.14	16.89	16.92	17.21	16.70
Fe2O3T	4.41	3.98	4.73	4.75	4.78	4.51	4.67	4.43	4.92	5.03	5.67	4.89	4.38	4.91	4.91	4.75
Fe_2O_3																
FeO																
MnO	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.07	0.08	0.08	0.09	0.08	0.07	0.08	0.08	0.07
MgO	2.57	2.33	2.60	2.65	2.72	2.57	2.66	2.52	2.95	2.86	3.26	2.75	2.54	2.79	2.80	2.71
CaO	5.22	5.35	5.10	5.25	5.50	5.39	5.60	5.34	5.62	5.74	5.50	5.47	5.64	5.71	5.58	5.23
Na_2O	3.58	3.50	3.84	3.78	3.98	3.97	3.95	3.86	3.55	4.03	3.66	3.85	3.98	3.93	3.96	3.73
K_2O	2.05	1.94	2.17	2.08	2.02	2.42	1.82	2.07	1.74	1.85	1.87	2.02	1.80	1.70	1.93	2.46
P_2O_5	0.13	0.11	0.14	0.15	0.15	0.13	0.15	0.13	0.14	0.15	0.15	0.15	0.13	0.15	0.15	0.14
LOI	1.04	0.87	0.73	1.05	1.34	1.34	0.98	1.13	1.11	0.83	1.15	1.18	1.00	1.11	1.03	1.14
TOL	99.64	99.60	98.88	99.14	100.28	99.90	99.97	99.78	99.00	99.76	99.52	99.64	99.95	99.89	99.76	99.87
Trace(ppm)																
Li																
Be																
Sc	13.7	14.6	12.3	11.8	13.0	13.5	13.4	12.3	12.2	12.2	14.1	12.2	13.0	12.9	14.1	13.4
V	74.3	70.5	89.5	85.4	85.7	79.3	78.6	74.9	83.1	84.9	96.9	81.8	77.0	84.2	86.3	85.9
Cr	37.8	35.0	38.2	39.5	39.8	33.7	39.5	38.8	41.3	41.9	53.9	37.8	38.1	41.4	42.0	40.6
Co																
Ni	21.9	18.7	24.0	22.1	21.2	21.2	19.6	20.9	23.3	20.5	26.8	21.4	20.4	20.0	22.6	20.8
Cu																
Zn																

Table S3: Continuted

Location	Datian pluton															
Sample	**DT-21**	**DT-22**	**DT-23**	**DT-24**	**DT-25**	**DT-27**	**DT-28**	**DT-29**	**DT-30**	**DT-31**	**DT-32**	**DT-33**	**DT-34**	**DT-35**	**DT-36**	**DT-37**
Rock type	**Alkaine mafic rock**															
Reference	**Zhao and Zhou, 2007**															
Age(Ma)								**760**								
Ga																
Ge																
Rb	69.2	54.5	70.8	70.3	63.1	59.2	67.6	67.6	63.4	54.3	71.3	64.9	56.8	56.5	62.4	71.9
Sr	497	511	519	543	545	562	550	518	548	534	482	511	510	536	517	540
Y	13.3	15.2	12.1	11.3	11.6	12.1	13.8	13.1	11.7	13.3	13.5	12.2	13.9	11.8	13.2	12.2
Zr	127	154	144	141	126	130	149	137	148	125	111	112	123	113	123	145
Nb	5.00	4.54	5.56	5.18	5.17	4.48	4.93	5.14	5.07	5.06	5.84	5.47	4.82	5.07	5.26	5.12
Sn																
Cs	2.12	2.45	2.96	2.71	2.16	2.16	3.85	2.89	1.97	2.07	3.70	2.38	2.12	2.17	2.52	3.20
Ba	707	707	671	835	674	1290	840	667	542	593	412	633	506	469	557	873
La	5.86	8.15	8.72	5.11	6.19	18.4	11.4	7.52	6.58	7.40	11.5	9.28	9.57	7.84	10.3	7.36
Ce	14.9	20.6	20.3	13.2	15.8	39.0	25.3	18.7	16.8	19.4	27.3	22.4	24.1	19.4	23.8	18.6
Pr	2.36	3.21	2.90	2.16	2.44	4.78	3.57	2.85	2.61	3.07	3.81	3.23	3.54	2.88	3.32	2.84
Nd	11.7	15.2	13.3	10.7	11.8	18.7	15.8	13.8	12.6	14.7	16.9	14.5	15.7	13.6	15.0	13.4
Sm	3.20	3.77	3.17	2.76	2.92	3.59	3.76	3.53	3.21	3.66	3.93	3.39	3.80	3.17	3.74	3.25
Eu	0.79	0.84	0.77	0.78	0.78	0.92	0.87	0.84	0.87	0.88	0.88	0.83	0.83	0.85	0.88	0.86
Gd	3.15	3.43	2.71	2.62	2.72	2.93	3.26	3.08	2.84	3.20	3.35	2.91	3.22	2.85	3.47	2.89
Tb	0.46	0.50	0.40	0.38	0.38	0.43	0.47	0.48	0.41	0.47	0.49	0.42	0.48	0.41	0.48	0.42
Dy	2.50	2.76	2.25	2.04	2.09	2.22	2.64	2.54	2.23	2.58	2.69	2.33	2.69	2.32	2.55	2.37
Ho	0.46	0.53	0.43	0.37	0.39	0.44	0.50	0.48	0.44	0.49	0.49	0.45	0.50	0.43	0.50	0.44
Er	1.37	1.53	1.25	1.12	1.17	1.29	1.49	1.41	1.28	1.46	1.47	1.32	1.51	1.27	1.37	1.33
Tm	0.18	0.22	0.17	0.15	0.16	0.19	0.21	0.20	0.17	0.20	0.20	0.18	0.21	0.17	0.18	0.18
Yb	1.22	1.45	1.07	0.99	1.02	1.21	1.37	1.29	1.18	1.30	1.35	1.21	1.38	1.14	1.19	1.20
Lu	0.16	0.20	0.15	0.15	0.15	0.18	0.21	0.19	0.17	0.19	0.19	0.18	0.20	0.17	0.17	0.18
Hf	3.61	4.27	3.85	3.66	3.23	3.71	4.17	3.88	4.10	3.67	3.22	3.33	3.65	3.23	3.42	3.92
Ta	0.33	0.32	0.33	0.23	0.29	0.30	0.44	0.36	0.29	0.28	0.42	0.47	0.42	0.29	0.37	0.41

Table S3: Continuted

Location	Datian pluton															
Sample	**DT-21**	**DT-22**	**DT-23**	**DT-24**	**DT-25**	**DT-27**	**DT-28**	**DT-29**	**DT-30**	**DT-31**	**DT-32**	**DT-33**	**DT-34**	**DT-35**	**DT-36**	**DT-37**
Rock type	**Alkaine mafic rock**															
Reference	**Zhao and Zhou, 2007**															
Age(Ma)	**760**															
Pb	13.0	12.4	10.4	10.7	10.2	13.9	14.0	14.2	10.5	11.4	11.2	12.7	13.8	11.1	12.0	14.0
Th	1.61	2.02	2.08	0.55	1.00	7.79	3.67	2.12	0.84	1.24	3.37	2.84	2.63	1.24	2.39	1.30
U	1.67	3.85	1.29	1.20	1.35	1.13	1.35	1.82	0.83	1.24	1.06	3.34	1.69	1.10	1.20	1.25
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)					0.705010			0.704865						0.705018		
$\varepsilon_{Nd\ (t)}$					-0.92			-0.55						-0.45		
Ratio																
Mg#	57.6	57.7	56.2	56.5	57.0	57.1	57.0	57.0	58.3	57.0	57.3	56.8	57.4	57.0	57.0	57.0
Sr/Y	37.4	33.5	42.8	48.1	46.9	46.3	39.8	39.6	46.9	40.2	35.8	41.9	36.8	45.3	39.2	44.3
Nb/La	0.85	0.56	0.64	1.01	0.83	0.24	0.43	0.68	0.77	0.68	0.51	0.59	0.50	0.65	0.51	0.70
Nb/U	3.00	1.18	4.31	4.32	3.83	3.96	3.65	2.82	6.13	4.09	5.53	1.64	2.85	4.61	4.39	4.08

Table S3: Continuted

Location																
Sample	**DT-38**	**DT-39**	**DT-40**	**DT-41**	**DT-42**	**DT-43**	**DT-45**	**DT-46**	**HL-15**	**HL-16**	**HL-17**	**HL-18**	**HL-19**	**HL-20**	**HL-21**	**HL-22**
Rock type																
Reference																
Age(Ma)																
Major(wt.%)																
SiO_2	63.51	64.54	61.90	61.82	61.79	61.45	64.76	63.10	62.91	51.23	60.47	51.58	60.64	60.70	59.78	59.90
TiO_2	0.41	0.35	0.40	0.48	0.54	0.52	0.51	0.53	0.53	0.74	0.65	0.74	0.59	0.61	0.64	0.68
Al_2O_3	17.11	16.74	17.54	17.07	16.44	16.94	16.27	17.29	16.83	18.93	17.79	20.96	17.63	17.16	17.21	17.22
Fe2O3T	3.95	3.53	3.58	4.50	4.79	4.59	4.27	4.71	4.62	8.11	5.21	6.73	4.97	5.32	5.85	5.72
Fe_2O_3																
FeO																
MnO	0.07	0.06	0.06	0.07	0.08	0.07	0.07	0.07	0.07	0.14	0.07	0.11	0.08	0.09	0.09	0.09
MgO	2.16	1.94	2.16	2.54	2.72	2.64	2.40	2.87	2.65	4.73	2.80	3.85	2.87	3.11	3.27	3.34
CaO	5.14	3.77	2.85	5.20	5.28	5.23	4.70	5.26	4.97	8.58	4.94	8.90	5.62	6.09	5.98	5.84
Na_2O	4.06	4.27	5.26	3.93	3.62	3.81	3.87	3.46	3.23	3.45	3.83	3.86	3.37	3.44	3.36	3.37
K_2O	2.00	2.44	2.06	2.29	2.10	2.22	1.95	1.94	2.41	0.59	1.67	0.96	1.91	1.85	1.97	2.01
P_2O_5	0.12	0.12	0.21	0.13	0.14	0.13	0.13	0.12	0.15	0.20	0.19	0.20	0.17	0.18	0.18	0.19
LOI	0.99	2.06	2.82	1.08	1.15	1.21	0.90	0.88	0.96	1.83	1.98	1.70	1.24	0.93	0.90	0.93
TOL	99.51	99.82	98.84	99.13	98.64	98.82	99.81	100.23	99.32	98.52	99.61	99.59	99.10	99.48	99.23	99.31
Trace(ppm)																
Li																
Be																
Sc	16.0	13.1	10.5	12.9	14.9	12.5	9.81	12.1	9.67	14.8	9.72	13.0	10.2	11.0	9.78	11.3
V	63.0	61.4	53.5	81.1	86.7	83.3	73.6	87.4	78.6	173	86.8	120	81.2	91.7	95.2	100
Cr	30.1	28.5	23.8	37.1	40.6	44.1	36.4	37.6	58.5	62.3	65.6	69.3	57.2	64.1	69.6	69.2
Co																
Ni	17.5	13.6	14.5	21.9	22.9	27.0	21.3	36.9	24.9	34.8	28.0	32.7	25.4	29.1	29.2	31.4
Cu																
Zn																

Table S3: Continuted

Location																
Sample	**DT-38**	**DT-39**	**DT-40**	**DT-41**	**DT-42**	**DT-43**	**DT-45**	**DT-46**	**HL-15**	**HL-16**	**HL-17**	**HL-18**	**HL-19**	**HL-20**	**HL-21**	**HL-22**
Rock type																
Reference																
Age(Ma)																
Ga																
Ge																
Rb	62.3	79.8	72.9	70.6	69.1	77.6	85.2	80.3	64.1	5.51	38.3	16.6	47.4	48.0	49.3	54.2
Sr	518	555	595	538	507	524	467	471	399	497	409	779	424	433	410	416
Y	12.6	12.7	7.42	10.6	13.5	11.8	9.84	11.9	10.5	10.9	8.40	15.4	10.1	12.8	11.4	12.8
Zr	121	151	62.0	145	113	172	101	182	114	71.5	113	152	100	92.9	58.1	111
Nb	4.97	4.05	5.17	5.07	5.41	5.56	5.75	5.52	4.32	3.10	3.69	2.89	3.96	4.64	4.40	4.92
Sn																
Cs	2.18	2.63	3.54	3.10	2.19	2.43	3.50	2.94	2.27	0.42	0.61	0.54	2.51	2.62	2.82	3.11
Ba	655	840	689	1070	675	620	329	490	752	392	633	406	514	482	575	457
La	12.0	13.8	76.0	11.4	17.1	10.3	3.56	6.00	13.2	17.5	17.0	13.4	10.7	11.1	33.0	13.3
Ce	24.6	29.3	154	24.3	35.6	23.1	8.25	15.1	27.1	29.7	33.6	28.7	24.9	26.6	65.4	29.3
Pr	3.22	3.82	14.7	3.17	4.38	3.12	1.29	2.34	3.86	3.70	4.28	4.13	3.47	3.82	7.51	4.21
Nd	13.9	16.0	48.1	13.0	17.6	13.6	6.74	10.9	16.6	15.0	17.1	19.2	15.6	17.9	27.1	18.4
Sm	3.43	3.51	6.39	3.01	3.71	3.06	2.04	2.83	3.42	2.89	2.93	4.29	3.39	3.97	4.67	3.91
Eu	0.89	0.79	1.06	0.85	0.82	0.81	0.60	0.70	0.88	0.86	0.87	0.95	0.80	0.85	0.93	0.80
Gd	3.20	3.10	3.43	2.48	3.31	2.64	2.11	2.57	2.21	2.07	2.41	2.50	2.07	2.26	4.17	2.36
Tb	0.47	0.45	0.47	0.38	0.47	0.40	0.31	0.38	0.37	0.35	0.35	0.47	0.36	0.41	0.57	0.42
Dy	2.52	2.34	1.68	1.97	2.55	2.16	1.80	2.13	2.13	2.04	1.89	2.70	2.06	2.38	3.06	2.38
Ho	0.47	0.44	0.28	0.38	0.45	0.41	0.35	0.42	0.44	0.47	0.36	0.63	0.44	0.53	0.51	0.52
Er	1.32	1.33	0.76	1.09	1.35	1.22	1.01	1.28	1.30	1.33	0.95	1.70	1.27	1.47	1.50	1.47
Tm	0.17	0.17	0.088	0.15	0.18	0.16	0.14	0.18	0.19	0.21	0.15	0.27	0.19	0.22	0.21	0.22
Yb	1.02	1.18	0.54	1.00	1.19	1.09	0.96	1.26	1.35	1.38	1.01	1.82	1.28	1.52	1.54	1.48
Lu	0.15	0.16	0.079	0.15	0.17	0.16	0.13	0.19	0.21	0.22	0.16	0.29	0.20	0.24	0.24	0.23
Hf	3.22	4.01	1.64	3.73	3.20	4.29	2.84	4.92	4.04	2.31	3.81	5.13	3.55	3.31	2.51	3.93
Ta	0.31	0.29	0.26	0.34	0.38	0.39	0.42	0.39	0.27	0.15	0.25	0.32	0.23	0.22	0.16	0.26

Table S3: Continuted

Location																
Sample	**DT-38**	**DT-39**	**DT-40**	**DT-41**	**DT-42**	**DT-43**	**DT-45**	**DT-46**	**HL-15**	**HL-16**	**HL-17**	**HL-18**	**HL-19**	**HL-20**	**HL-21**	**HL-22**
Rock type																
Reference																
Age(Ma)																
Pb	14.4	12.4	8.85	13.2	12.0	13.7	11.1	12.3	13.3	6.47	8.17	8.67	11.5	12.4	12.4	11.6
Th	2.47	5.34	18.7	3.41	4.61	2.72	1.70	1.94	2.66	0.87	0.34	0.96	1.47	0.88	9.88	1.89
U	0.78	2.08	1.02	1.79	1.45	0.97	2.63	1.39	0.96	0.30	0.17	0.67	0.69	1.05	0.85	0.77
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)										0.704546						
$\varepsilon_{Nd\ (t)}$										0.62						
Ratio																
Mg#	56.1	56.1	58.5	56.8	57.0	57.2	56.7	58.7	57.1	57.6	55.6	57.1	57.4	57.6	56.5	57.7
Sr/Y	41.0	43.8	80.2	50.9	37.7	44.4	47.5	39.5	37.9	45.5	48.7	50.5	42.0	33.9	35.9	32.4
Nb/La	0.41	0.29	0.068	0.44	0.32	0.54	1.61	0.92	0.33	0.18	0.22	0.22	0.37	0.42	0.13	0.37
Nb/U	6.39	1.94	5.07	2.83	3.73	5.73	2.18	3.98	4.52	10.4	22.0	4.33	5.79	4.41	5.16	6.40

Table S3: Continuted

Location	Dajianshan pluton															
Sample	HL-23	HL-24	HL-26	HL-01	HL-02	HL-03	HL-04	HL-05	HL-06	HL-07	HL-08	HL-09	HL-10	HL-11	HL-12	HL-13
Rock type	Alkaine mafic rock															
Reference	Zhao and Zhou, 2007															
Age(Ma)				760												
Major(wt.%)																
SiO_2	54.82	52.79	52.36	55.67	50.96	55.77	51.35	55.35	56.88	55.92	57.26	56.68	56.24	56.65	56.28	52.22
TiO_2	0.67	0.69	0.82	0.64	0.85	0.64	0.80	0.68	0.68	0.70	0.67	0.62	0.64	0.65	0.61	0.66
Al_2O_3	19.43	19.20	20.25	17.99	20.24	18.08	19.71	17.61	17.47	18.12	17.65	17.55	18.30	18.51	18.55	19.27
Fe2O3T	6.19	6.86	7.05	6.89	8.41	6.85	8.13	7.34	7.05	6.94	6.87	6.69	6.81	7.02	6.48	7.91
Fe_2O_3																
FeO																
MnO	0.09	0.10	0.10	0.12	0.14	0.12	0.17	0.12	0.12	0.13	0.13	0.12	0.12	0.12	0.11	0.13
MgO	3.17	2.12	3.90	4.04	4.15	3.80	4.47	4.41	3.92	3.95	3.93	3.82	3.80	4.09	3.66	4.50
CaO	6.85	12.27	6.10	7.12	8.82	7.48	8.13	6.91	7.40	7.38	6.33	7.29	7.36	7.64	6.95	7.97
Na_2O	3.77	3.31	3.66	3.29	3.89	3.39	3.80	3.05	3.21	3.42	3.43	3.19	3.37	3.38	3.34	3.44
K_2O	1.10	0.02	1.13	1.06	0.54	0.80	0.47	1.09	0.84	0.77	1.45	0.79	0.87	0.83	0.69	0.93
P_2O_5	0.29	0.30	0.33	0.18	0.18	0.18	0.27	0.19	0.16	0.18	0.15	0.18	0.18	0.19	0.19	0.21
LOI	2.80	2.14	3.58	1.66	1.17	1.77	1.50	2.19	1.28	1.62	1.73	1.65	1.08	0.87	2.14	2.08
TOL	99.19	99.81	99.27	98.66	99.36	98.89	98.80	98.94	99.02	99.12	99.59	98.58	98.75	99.95	99.00	99.32
Trace(ppm)																
Li																
Be																
Sc	9.37	9.16	10.7	14.4	16.2	15.1	13.9	15.9	13.6	12.1	12.7	13.6	14.0	14.2	11.6	15.7
V	113	122	142	131	140	123	118	138	134	117	102	115	116	124	106	146
Cr	31.5	30.4	74.9	70.3	80.5	62.5	80.0	79.6	77.4	54.4	68.8	60.9	58.3	59.6	50.7	88.7
Co																
Ni	19.4	26.0	29.8	31.4	29.0	28.1	30.7	32.1	36.6	25.9	27.9	28.2	27.8	28.6	26.0	34.8
Cu																
Zn																

Table S3: Continuted

Location	Dajianshan pluton															
Sample	HL-23	HL-24	HL-26	HL-01	HL-02	HL-03	HL-04	HL-05	HL-06	HL-07	HL-08	HL-09	HL-10	HL-11	HL-12	HL-13
Rock type	Alkaine mafic rock															
Reference	Zhao and Zhou, 2007															
Age(Ma)				760												
Ga																
Ge																
Rb	25.6	0.27	25.4	11.5	4.10	8.02	3.39	12.0	10.0	4.82	23.3	9.64	9.36	9.85	8.28	10.9
Sr	630	1020	524	496	654	510	614	414	508	473	412	475	489	522	522	530
Y	8.15	9.14	12.1	11.2	17.9	11.8	12.5	15.3	16.2	10.6	13.1	11.1	10.2	10.9	10.2	15.7
Zr	65.7	45.7	73.1	24.1	250	88.7	114	88.0	88.9	65.3	45.3	56.1	90.9	78.4	76.9	113
Nb	3.35	2.46	3.60	3.36	3.16	3.44	2.99	4.34	3.87	3.36	3.04	3.46	3.13	3.36	3.24	3.30
Sn																
Cs	1.05	0.09	1.40	0.33	0.13	0.24	0.14	0.25	0.23	0.19	0.37	0.23	0.13	0.13	0.18	0.27
Ba	242	11.6	327	556	304	498	301	505	570	378	702	429	450	467	454	522
La	21.4	18.5	21.5	18.1	18.1	17.4	17.7	22.3	19.9	16.9	16.9	18.6	18.9	19.5	19.4	19.2
Ce	35.6	33.2	41.4	32.3	34.9	32.0	33.2	40.8	37.1	31.4	34.0	32.9	32.6	33.8	32.9	38.0
Pr	4.41	4.04	5.31	3.98	4.98	4.04	4.34	5.34	4.99	3.69	4.25	3.96	3.97	4.01	4.01	5.18
Nd	17.2	17.0	22.8	15.9	22.3	16.9	18.4	21.2	21.0	14.8	17.7	16.2	15.9	16.2	15.9	22.1
Sm	2.91	3.10	4.09	3.00	4.57	3.26	3.47	4.01	4.07	2.60	3.44	3.01	2.91	3.01	2.94	4.21
Eu	0.68	0.62	0.86	0.92	1.10	0.87	0.91	0.92	0.99	0.79	1.00	0.82	0.82	0.84	0.81	0.99
Gd	2.30	2.25	2.98	2.31	2.83	2.41	2.46	3.03	2.82	2.17	2.45	2.30	2.34	2.34	2.32	2.96
Tb	0.34	0.36	0.48	0.36	0.50	0.39	0.42	0.49	0.47	0.33	0.40	0.36	0.36	0.36	0.36	0.49
Dy	1.84	1.96	2.64	2.06	3.16	2.24	2.38	2.79	2.79	1.90	2.35	2.07	2.06	2.07	2.03	2.87
Ho	0.33	0.38	0.52	0.46	0.73	0.51	0.53	0.63	0.62	0.41	0.53	0.46	0.45	0.46	0.44	0.66
Er	0.91	1.01	1.47	1.32	2.08	1.44	1.53	1.77	1.80	1.21	1.48	1.30	1.31	1.31	1.26	1.87
Tm	0.14	0.15	0.23	0.20	0.34	0.22	0.23	0.28	0.29	0.19	0.23	0.20	0.20	0.20	0.19	0.30
Yb	0.97	0.98	1.57	1.30	2.25	1.45	1.56	1.84	1.82	1.24	1.51	1.35	1.32	1.34	1.27	1.96
Lu	0.15	0.15	0.24	0.21	0.36	0.23	0.25	0.30	0.30	0.20	0.25	0.22	0.21	0.21	0.21	0.31
Hf	2.33	1.86	2.67	1.09	7.10	2.81	3.73	2.98	2.98	2.29	1.82	2.14	2.94	2.66	2.66	3.62
Ta	0.15	0.11	0.17	0.17	0.47	0.18	0.24	0.19	0.19	0.14	0.12	0.14	0.19	0.17	0.18	0.24

Table S3: Continuted

Location	Dajianshan pluton															
Sample	**HL-23**	**HL-24**	**HL-26**	**HL-01**	**HL-02**	**HL-03**	**HL-04**	**HL-05**	**HL-06**	**HL-07**	**HL-08**	**HL-09**	**HL-10**	**HL-11**	**HL-12**	**HL-13**
Rock type				**Alkaine mafic rock**												
Reference				**Zhao and Zhou, 2007**												
Age(Ma)				**760**												
Pb	9.41	11.6	9.12	5.93	5.08	6.51	4.71	5.97	6.68	6.15	5.37	6.80	5.88	5.99	6.31	5.39
Th	4.25	2.25	1.63	0.79	0.28	0.74	0.24	1.84	0.94	0.77	0.29	0.53	0.48	0.47	1.52	0.25
U	0.97	0.63	0.47	0.11	0.17	0.09	0.40	0.20	0.16	0.06	0.26	0.12	0.11	0.34	0.09	0.11
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)	0.704803							0.704688						0.704613		
$\varepsilon_{Nd\ (t)}$	-0.01							0.66						0.45		
Ratio																
Mg#	54.4	41.8	56.3	57.7	53.5	56.4	56.1	58.3	56.4	57.0	57.1	57.1	56.5	57.5	56.8	57.0
Sr/Y	77.3	111	43.2	44.4	36.5	43.2	48.9	27.0	31.3	44.6	31.5	42.9	48.0	48.1	51.0	33.7
Nb/La	0.16	0.13	0.17	0.19	0.17	0.20	0.17	0.20	0.19	0.20	0.18	0.19	0.17	0.17	0.17	0.17
Nb/U	3.45	3.90	7.63	31.7	18.7	40.5	7.52	21.7	23.9	53.3	11.7	29.3	27.7	9.79	38.2	29.2

Table S3: Continuted

Location		Xuelongbao													
Sample	**HL-14**	**XL-4**	**XL-6**	**XL-7**	**XL-19**	**XL-20**	**XL-21**	**XL-25**	**XL-26**	**XL-28**	**XL-29**	**XL-34**	**XL-35**	**XL-36**	**XL-38**
Rock type		Alkaine mafic rock													
Reference		Zhou et al., 2006													
Age(Ma)		748													
Major(wt.%)															
SiO_2	54.25	66.80	67.00	68.20	66.80	71.00	62.00	70.10	72.00	67.50	71.10	65.30	66.50	65.60	65.70
TiO_2	0.64	0.36	0.31	0.30	0.28	0.15	0.49	0.22	0.12	0.34	0.11	0.26	0.26	0.36	0.35
Al_2O_3	19.03	17.76	17.20	16.83	17.66	16.88	17.07	15.60	16.35	16.39	16.10	17.75	17.41	17.46	17.31
Fe2O3T	6.84	3.35	2.89	2.62	3.07	1.81	5.09	2.12	1.17	3.25	1.19	3.12	2.93	3.67	3.47
Fe_2O_3															
FeO															
MnO	0.11	0.05	0.06	0.05	0.06	0.04	0.09	0.03	0.01	0.03	0.02	0.06	0.05	0.08	0.06
MgO	3.87	1.56	1.42	1.42	1.02	0.64	2.39	0.66	0.43	1.34	0.35	0.99	1.00	1.70	1.32
CaO	7.41	3.60	3.51	2.66	5.29	4.14	5.91	3.24	2.03	2.24	2.52	5.29	5.10	2.92	5.04
Na_2O	3.27	4.65	4.83	5.07	4.93	4.95	4.19	6.71	6.54	5.02	5.67	4.45	4.66	5.64	4.66
K_2O	0.90	1.72	1.70	1.92	1.10	0.74	1.17	0.47	1.08	1.86	1.40	1.16	0.88	1.55	1.34
P_2O_5	0.20	0.14	0.13	0.12	0.15	0.08	0.15	0.09	0.04	0.13	0.06	0.15	0.13	0.15	0.15
LOI	2.30	1.61	1.43	1.43	0.91	0.97	1.85	0.98	1.01	2.46	1.92	1.16	1.19	1.39	1.07
TOL	98.83	101.60	100.40	100.60	101.20	101.40	100.50	100.20	100.80	100.60	100.40	99.70	100.10	100.50	100.50
Trace(ppm)															
Li															
Be															
Sc	12.0	9.24	10.1	8.60	9.45	6.60	10.3	10.3	9.39	8.63	7.82	8.24	7.17	9.58	7.82
V	123														
Cr	65.1														
Co															
Ni	27.8														
Cu															
Zn															

Table S3: Continuted

Location		Xuelongbao													
Sample	**HL-14**	**XL-4**	**XL-6**	**XL-7**	**XL-19**	**XL-20**	**XL-21**	**XL-25**	**XL-26**	**XL-28**	**XL-29**	**XL-34**	**XL-35**	**XL-36**	**XL-38**
Rock type		Alkaine mafic rock													
Reference		Zhou et al., 2006													
Age(Ma)		748													
Ga		2.00	2.48	2.57	1.83	1.31	2.02	0.86	0.60	1.26	0.60	1.32	1.37	1.80	1.79
Ge															
Rb	10.5	38.0	36.0	34.0	29.0	19.0	33.0	7.00	18.0	36.0	23.0	28.0	20.0	33.0	31.0
Sr	522	610	576	481	725	548	671	403	371	320	388	710	737	431	702
Y	12.8	5.93	7.45	3.74	5.81	3.57	11.2	3.61	1.87	3.53	1.78	5.55	3.77	4.80	5.89
Zr	93.0	64.0	72.0	78.0	67.0	57.0	83.0	112	82.0	83.0	54.0	82.0	73.0	92.0	91.0
Nb	3.12	2.00	2.48	2.57	1.83	1.31	2.02	0.86	0.60	1.26	0.60	1.32	1.37	1.80	1.79
Sn															
Cs	0.38														
Ba	543	690	583	603	367	423	577	304	622	858	594	574	444	419	411
La	19.4	25.0	18.0	7.00	3.00	19.0	8.00	23.0	7.00	10.0	5.00	3.00	2.00	2.00	2.00
Ce	34.8	51.0	36.0	13.0	6.00	37.0	19.0	44.0	13.0	21.0	8.00	6.00	4.00	5.00	6.00
Pr	4.39														
Nd	18.3	18.0	14.0	6.00	4.00	13.0	12.0	19.0	5.00	9.00	4.00	4.00	3.00	3.00	4.00
Sm	3.52	2.59	2.42	1.02	1.28	1.93	2.77	2.86	0.73	1.61	0.67	1.29	0.80	0.96	1.40
Eu	0.93	0.67	0.65	0.39	0.60	0.69	0.82	0.68	0.41	0.52	0.46	0.60	0.45	0.54	0.56
Gd	2.54	2.65	2.34	1.01	1.23	1.92	2.56	2.55	0.74	1.60	0.64	1.16	0.79	0.98	1.23
Tb	0.41	0.26	0.27	0.11	0.19	0.18	0.34	0.21	0.07	0.16	0.07	0.18	0.12	0.15	0.18
Dy	2.42	1.13	1.42	0.62	1.06	0.73	2.02	0.78	0.34	0.81	0.31	0.97	0.64	0.82	1.03
Ho	0.55	0.21	0.25	0.12	0.20	0.12	0.39	0.13	0.06	0.13	0.06	0.20	0.13	0.17	0.21
Er	1.53	0.64	0.76	0.37	0.55	0.40	1.21	0.43	0.21	0.36	0.19	0.60	0.38	0.48	0.60
Tm	0.23	0.09	0.11	0.05	0.08	0.05	0.16	0.05	0.03	0.04	0.02	0.08	0.05	0.07	0.09
Yb	1.51	0.53	0.73	0.36	0.53	0.35	1.12	0.38	0.26	0.28	0.17	0.56	0.34	0.47	0.55
Lu	0.24	0.08	0.11	0.06	0.09	0.05	0.16	0.05	0.05	0.04	0.03	0.08	0.06	0.06	0.08
Hf	3.00	1.66	1.90	2.20	1.67	1.52	2.09	3.20	2.18	2.13	1.37	1.91	1.79	2.26	2.17
Ta	0.19	0.14	0.19	0.34	0.10	0.06	0.10	0.04	0.03	0.04	0.03	0.06	0.06	0.08	0.14

Table S3: Continuted

Location		Xuelongbao													
Sample	**HL-14**	**XL-4**	**XL-6**	**XL-7**	**XL-19**	**XL-20**	**XL-21**	**XL-25**	**XL-26**	**XL-28**	**XL-29**	**XL-34**	**XL-35**	**XL-36**	**XL-38**
Rock type		**Alkaine mafic rock**													
Reference		**Zhou et al., 2006**													
Age(Ma)		**748**													
Pb	5.34	7.33	9.28	6.76	13.6	12.3	9.63	3.46	5.35	5.76	6.38	11.1	8.59	9.10	10.5
Th	0.31	5.64	3.82	1.73	0.32	4.34	0.83	4.48	1.17	1.36	0.56	0.08	0.10	0.11	0.36
U		0.48	0.64	0.62	0.55	0.21	0.20	0.27	0.21	0.18	0.07	0.21	0.25	0.29	0.53
Isotopic date															
$^{87}Sr/^{86}Sr$ (t)		0.703650		0.703610	0.703760	0.704210				0.703300					
$\varepsilon_{Nd\ (t)}$		2.54		2.87	2.88	2.33				1.66					
Ratio															
Mg#	56.9	52.0	53.4	55.8	43.6	45.2	52.3	42.0	46.1	49.0	40.7	42.5	44.3	51.9	47.0
Sr/Y	40.9	103	77.3	129	125	154	60.0	112	198	90.7	218	128	195	89.8	119
Nb/La	0.16	0.080	0.14	0.37	0.61	0.069	0.25	0.037	0.086	0.13	0.12	0.44	0.69	0.90	0.90
Nb/U		4.17	3.88	4.15	3.33	6.24	10.1	3.19	2.86	7.00	8.57	6.29	5.48	6.21	3.38

Table S3: Continuted

Location										Yaunmou pluton						
Sample	XL-67	XG-1	XG-2	XG-3	XG5-1	XG5-2	XG5-3	XG-6	XG-7	JWL16-51	JWL16-52	JWL16-53	JWL16-54	JWL16-55	JWL16-56	JWL16-57
Rock type										Alkaine mafic rock						
Reference										This study						
Age(Ma)										806						
Major(wt.%)																
SiO_2	68.00	64.50	67.50	65.20	64.80	74.80	65.10	65.70	65.90	48.69	49.07	47.90	48.19	49.04	48.18	45.76
TiO_2	0.32	0.39	0.31	0.39	0.47	0.08	0.44	0.37	0.42	2.46	3.23	2.13	3.39	3.26	3.28	3.18
Al_2O_3	16.61	17.32	16.56	16.99	16.05	14.33	16.42	17.04	16.61	10.84	9.46	11.60	10.10	9.43	9.89	11.48
Fe2O3T	3.13	3.63	2.90	3.38	4.11	0.97	3.87	3.60	3.37	12.61	12.37	12.67	12.60	12.48	12.49	16.03
Fe_2O_3																
FeO																
MnO	0.06	0.06	0.05	0.06	0.07	0.02	0.07	0.06	0.05	0.18	0.17	0.17	0.20	0.19	0.17	0.21
MgO	1.53	1.35	0.99	1.31	2.30	0.21	2.11	1.41	1.29	9.70	9.49	9.67	8.72	9.50	9.41	7.04
CaO	3.52	4.86	4.00	4.69	4.55	2.10	4.74	5.00	4.35	9.42	10.33	9.21	9.62	10.34	10.02	8.97
Na_2O	4.37	5.56	4.82	4.57	6.23	6.23	5.64	5.83	4.70	2.00	1.36	2.25	1.77	1.44	1.61	2.64
K_2O	1.81	1.02	1.20	1.76	1.18	1.15	1.06	1.06	1.96	0.83	1.26	0.72	0.88	1.23	1.15	1.28
P_2O_5	0.12	0.17	0.13	0.15	0.12	0.01	0.11	0.15	0.15	0.23	0.35	0.23	0.38	0.35	0.36	0.36
LOI	1.60	0.86	0.67	0.89	0.79	0.69	0.77	0.70	0.98	2.33	1.55	2.13	2.40	1.70	1.94	2.55
TOL	101.10	99.70	99.10	99.40	100.70	100.60	100.30	100.90	99.80	99.27	98.63	98.69	98.24	98.95	98.50	99.49
Trace(ppm)																
Li										15.1	11.8	23.4	19.3	12.6	16.5	18.3
Be										1.55	1.38	1.55	1.85	1.50	1.63	2.16
Sc	8.96	7.88	5.19	7.04	12.3	6.27	11.0	9.38	8.69	32.8	36.4	32.4	33.7	35.5	33.6	38.5
V										369	398	375	394	397	381	629
Cr										912	925	912	805	924	881	412
Co																
Ni										215	85.2	232	69.0	80.6	80.1	147
Cu										133	34.7	131	24.5	35.6	49.5	277
Zn										155	135	128	148	141	134	201

Table S3: Continuted

Location										Yaunmou pluton						
Sample	XL-67	XG-1	XG-2	XG-3	XG5-1	XG5-2	XG5-3	XG-6	XG-7	JWL16-51	JWL16-52	JWL16-53	JWL16-54	JWL16-55	JWL16-56	JWL16-57
Rock type										Alkaine mafic rock						
Reference										This study						
Age(Ma)										806						
Ga	2.44	1.72	1.18	1.95	2.35	1.48	2.35	1.85	2.47	19.3	19.6	19.7	21.8	19.9	20.7	25.6
Ge																
Rb	49.0	24.0	26.0	53.0	32.0	18.0	27.0	26.0	41.0	27.1	18.9	27.0	17.0	17.4	14.9	53.0
Sr	551	701	664	775	460	322	480	675	611	370	621	321	538	651	573	445
Y	6.29	5.84	2.09	5.75	9.73	4.28	9.30	6.98	6.43	23.1	25.5	24.8	26.2	25.7	25.3	30.2
Zr	90.0	52.0	53.0	72.0	59.0	47.0	33.0	35.0	54.0	211	347	171	372	351	357	270
Nb	2.44	1.72	1.18	1.95	2.35	1.48	2.35	1.85	2.47	20.5	33.0	15.7	35.4	33.1	33.7	41.9
Sn																
Cs										0.57	0.23	0.75	0.22	0.25	0.26	1.52
Ba	745	495	570	465	608	849	549	385	932	268	962	779	498	1260	533	418
La	14.0	2.00	19.0	2.00	9.00	7.00	11.0	12.0	13.0	23.8	43.3	20.3	46.6	45.3	43.6	43.1
Ce	27.0	6.00	36.0	4.00	19.0	14.0	24.0	24.0	26.0	54.5	95.9	42.8	105	99.5	101	91.9
Pr										6.86	12.6	5.87	13.3	13.1	12.8	10.9
Nd	11.0	5.00	14.0	3.00	11.0	6.00	13.0	11.0	13.0	30.4	54.0	25.4	57.8	56.0	54.9	44.5
Sm	2.02	1.50	1.67	0.90	2.46	0.92	2.52	2.07	2.53	6.64	10.2	5.82	10.6	11.0	10.4	8.80
Eu	0.56	0.63	0.52	0.40	0.79	0.54	0.77	0.63	0.78	1.94	2.79	1.78	3.06	2.97	2.88	2.49
Gd	1.90	1.32	1.17	0.75	2.27	0.75	2.21	1.75	2.11	6.50	9.58	6.08	9.54	10.0	9.25	8.83
Tb	0.22	0.22	0.12	0.12	0.36	0.11	0.33	0.26	0.29	0.98	1.34	0.94	1.33	1.32	1.34	1.28
Dy	1.09	1.29	0.50	0.63	2.10	0.67	1.93	1.43	1.56	5.16	6.31	5.23	6.65	6.87	6.61	7.21
Ho	0.23	0.26	0.09	0.13	0.44	0.16	0.37	0.29	0.27	0.91	1.05	0.95	1.13	1.10	1.07	1.26
Er	0.70	0.72	0.26	0.39	1.21	0.53	1.09	0.85	0.70	2.46	2.87	2.75	2.92	3.02	3.03	3.61
Tm	0.09	0.10	0.04	0.06	0.17	0.08	0.15	0.11	0.09	0.31	0.35	0.35	0.37	0.35	0.35	0.47
Yb	0.71	0.62	0.22	0.40	1.09	0.61	0.98	0.74	0.48	1.98	2.22	2.17	2.17	2.27	2.16	3.03
Lu	0.10	0.10	0.04	0.06	0.18	0.11	0.16	0.10	0.08	0.29	0.33	0.34	0.30	0.33	0.32	0.45
Hf	2.66	1.53	1.63	1.35	2.13	1.76	1.16	1.10	1.52	5.07	9.84	4.47	9.68	9.23	9.54	7.42
Ta	0.23	0.11	0.08	0.10	0.19	0.13	0.21	0.18	0.11	1.22	2.25	0.99	2.33	2.18	2.25	2.69

Table S3: Continuted

Location										Yaunmou pluton						
Sample	XL-67	XG-1	XG-2	XG-3	XG5-1	XG5-2	XG5-3	XG-6	XG-7	JWL16-51	JWL16-52	JWL16-53	JWL16-54	JWL16-55	JWL16-56	JWL16-57
Rock type										Alkaine mafic rock						
Reference										This study						
Age(Ma)										806						
Pb	8.85	9.45	9.14	9.99	7.75	8.03	7.91	10.8	8.92	3.39	5.28	2.95	10.1	6.16	5.11	5.65
Th	3.99	0.21	5.04	0.33	2.07	2.20	2.72	3.23	2.31	3.55	5.91	2.35	6.39	6.05	6.17	7.35
U	0.70	0.49	0.86	0.67	0.94	0.62	0.94	0.78	0.27	0.83	1.36	0.51	1.89	1.40	1.46	1.68
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)		0.704730		0.705430												
$\varepsilon_{Nd\ (t)}$		1.07		0.36												
Ratio																
Mg#	53.3	46.4	44.3	47.5	56.6	33.5	56.0	47.7	47.1	64.2	64.1	64.0	61.7	64.0	63.7	50.6
Sr/Y	87.6	120	318	135	47.3	75.2	51.6	96.7	95.0	16.0	24.4	13.0	20.5	25.4	22.7	14.8
Nb/La	0.17	0.86	0.062	0.98	0.26	0.21	0.21	0.15	0.19	0.86	0.76	0.77	0.76	0.73	0.77	0.97
Nb/U	3.49	3.51	1.37	2.91	2.50	2.39	2.50	2.37	9.15	24.7	24.2	30.9	18.7	23.7	23.2	24.9

Table S3: Continuted

Location	Suxiong basalt															
Sample	JWL16-58	YM18-01	YM18-02	YM18-03	YM18-04	99KD22-1	99KD22-2	99KD22-3	99KD22-4	99KD22-5	99KD22-6	99KD22-7	99KD22-8	XC06-23	XC06-24	XC06-25
Rock type		Alkaine mafic rock				Alkaline mafic rock										
Reference		This study				Li et al. 2002										
Age(Ma)		802				803										795
Major(wt.%)																
SiO_2	48.72	49.54	49.22	48.04	49.36	45.15	43.96	43.36	46.94	42.43	45.06	44.18	48.35	47.84	47.85	47.69
TiO_2	2.61	2.44	2.31	2.24	2.37	2.70	2.69	2.81	2.52	2.44	3.03	2.48	2.78	3.95	3.94	3.94
Al_2O_3	12.38	13.36	12.25	11.73	12.45	13.38	12.89	13.77	12.18	13.31	14.58	14.55	14.17	13.60	13.59	13.67
Fe2O3T	12.91	11.77	11.79	12.08	11.92	15.17	17.12	14.10	14.03	11.85	15.57	14.46	13.08	12.40	12.44	12.43
Fe_2O_3																
FeO																
MnO	0.17	0.15	0.16	0.15	0.16	0.22	0.16	0.17	0.17	0.27	0.19	0.14	0.17	0.18	0.18	0.18
MgO	8.04	7.40	8.23	10.14	8.09	9.30	9.16	10.97	10.08	11.96	8.27	7.03	7.24	4.98	5.08	4.74
CaO	8.34	8.89	9.98	8.77	9.14	10.87	11.10	12.30	9.33	16.65	9.00	15.69	10.47	8.71	8.85	8.48
Na_2O	2.50	2.58	2.57	2.33	3.02	1.37	1.33	1.01	2.33	0.00	2.31	0.88	1.85	2.77	2.71	2.70
K_2O	1.26	0.92	0.86	1.15	0.73	1.38	1.15	1.12	2.06	0.67	1.67	0.36	1.40	1.55	1.55	1.64
P_2O_5	0.28	0.25	0.24	0.23	0.24	0.34	0.43	0.44	0.52	0.54	0.38	0.35	0.31	0.58	0.58	0.61
LOI	2.42	2.65	2.20	2.70	2.24	2.05	2.20	3.01	2.78	3.05	2.98	2.51	1.85	1.97	1.82	2.46
TOL	99.62	99.94	99.79	99.56	99.73	99.90	99.98	100.06	100.16	100.12	100.05	100.13	99.84	98.53	98.59	98.54
Trace(ppm)																
Li	14.5	11.0	10.9	15.7	10.4											
Be	1.22	1.41	1.28	1.18	1.37											
Sc	30.4	32.7	32.1	31.7	34.1									28.0	28.0	28.0
V	383	306	294	284	315	252	255	233	189	173	241	296	271	397	394	385
Cr	634	606	566	671	593	292	383	165	277	102	284	275	290	32.0	37.0	28.0
Co		43.3	51.0	53.0	44.7									44.0	45.0	43.0
Ni	145	164	173	371	248	295	285	178	158	127	185	154	177	63.0	65.0	58.0
Cu	109	94.2	115	101	100									155	170	148
Zn	141	97.5	96.6	105	102									130	131	129

Table S3: Continuted

Location	Suxiong basalt															
Sample	JWL16-58	YM18-01	YM18-02	YM18-03	YM18-04	99KD22-1	99KD22-2	99KD22-3	99KD22-4	99KD22-5	99KD22-6	99KD22-7	99KD22-8	XC06-23	XC06-24	XC06-25
Rock type		Alkaine mafic rock				Alkaline mafic rock										
Reference		This study				Li et al. 2002										
Age(Ma)		802				803										795
Ga	20.8	20.6	19.4	19.0	20.9	18.7	20.4	18.8	14.5	18.8	17.1	21.7	18.7			
Ge																
Rb	50.8	31.1	24.9	40.7	17.5	42.8	56.1	29.8	57.8	20.4	54.8	11.7	23.8	26.0	27.0	31.0
Sr	466	411	428	459	591	439	362	376	250	701	304	751	635	710	703	695
Y	25.2	27.5	26.2	26.7	28.8	24.2	21.1	21.8	21.1	19.4	19.9	21.8	22.6	33.0	31.0	31.0
Zr	216	196	197	184	209	188	185	215	201	194	198	168	192	356	360	360
Nb	21.9	27.4	26.1	25.7	28.2	26.8	29.2	32.5	30.1	29.1	27.1	24.3	26.5	35.0	36.0	36.0
Sn																
Cs	0.87	0.59	0.47	0.74	0.19	10.4	20.7	7.78	17.9	5.44	13.1	2.78	1.13			
Ba	853	210	552	2030	1360	420	164	193	348	64.2	183	86.8	335	524	519	559
La	25.6	33.8	30.3	30.8	33.5	22.5	28.4	26.0	26.7	26.8	23.6	23.4	22.4	46.0	47.0	49.0
Ce	54.9	65.4	64.5	62.8	68.1	51.4	59.5	57.4	58.5	60.1	50.0	49.4	49.7	106	106	115
Pr	7.35	7.93	7.46	7.45	8.09	6.48	7.53	6.83	7.39	7.30	6.22	6.09	6.14	14.0	15.0	16.0
Nd	32.6	33.5	31.5	31.2	33.8	29.2	32.6	29.6	32.7	30.9	27.9	26.8	27.4	62.0	65.0	68.0
Sm	7.30	6.96	6.61	6.74	7.24	6.17	6.44	6.07	6.28	6.13	5.79	5.52	5.70	12.0	12.0	13.0
Eu	2.19	1.93	1.87	1.99	2.15	1.95	1.87	1.91	1.97	1.85	1.46	1.61	2.03	3.40	3.37	3.55
Gd	7.09	6.12	5.78	5.92	6.44	5.80	5.99	5.67	5.70	5.40	5.28	5.25	5.57	9.95	10.1	10.8
Tb	1.06	0.91	0.82	0.88	0.94	0.86	0.84	0.80	0.79	0.76	0.72	0.75	0.81	1.43	1.41	1.51
Dy	5.73	5.35	4.94	4.96	5.31	4.59	4.18	4.16	4.06	3.77	3.84	4.11	4.35	7.59	7.65	8.07
Ho	1.06	1.03	0.96	0.98	1.07	0.84	0.73	0.74	0.70	0.64	0.72	0.72	0.79	1.31	1.35	1.42
Er	2.88	2.58	2.43	2.57	2.63	2.11	1.80	1.86	1.78	1.67	1.90	1.85	2.11	3.31	3.41	3.62
Tm	0.36	0.37	0.36	0.34	0.37	0.29	0.25	0.28	0.26	0.24	0.27	0.27	0.31	0.48	0.49	0.50
Yb	2.29	2.27	2.01	2.16	2.25	1.68	1.34	1.49	1.41	1.32	1.53	1.42	1.75	2.59	2.77	2.82
Lu	0.33	0.31	0.29	0.29	0.31	0.25	0.19	0.22	0.21	0.19	0.23	0.21	0.26	0.38	0.40	0.41
Hf	5.72	4.81	4.82	4.61	5.16	4.20	4.18	4.52	4.32	4.19	4.44	3.72	4.44	9.15	9.11	9.73
Ta	1.43	1.62	1.53	1.51	1.61	1.71	1.88	2.12	1.90	1.83	1.77	1.54	1.71	2.18	2.23	2.35

Table S3: Continuted

Location	Suxiong basalt														
Sample	JWL16-58	YM18-01	YM18-02	YM18-03	YM18-04	99KD22-1	99KD22-2	99KD22-3	99KD22-4	99KD22-5	99KD22-6	99KD22-7	99KD22-8	XC06-23	XC06-24	XC06-25
Rock type		Alkaine mafic rock				Alkaline mafic rock										
Reference		This study				Li et al. 2002										
Age(Ma)		802				803									795	
Pb	3.77	2.79	2.89	3.35	4.04									6.97	6.57	7.16
Th	3.49	4.53	4.45	4.25	4.79	2.18	2.20	2.70	2.48	2.41	2.39	2.06	2.19	6.30	6.33	6.82
U	0.83	1.06	0.90	0.90	0.96	0.73	0.64	0.80	0.64	0.60	0.57	0.67	0.56	1.42	1.45	1.52
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)															0.703578	0.703396
$\varepsilon_{Nd\ (t)}$					0.00				5.00	5.32			5.96		3.46	3.22
Ratio																
Mg#	59.2	59.5	61.9	66.2	61.3	58.8	55.5	64.5	62.6	70.2	55.3	53.1	56.3	48.3	48.8	47.1
Sr/Y	18.5	14.9	16.3	17.2	20.5	18.1	17.2	17.2	11.8	36.1	15.3	34.4	28.1	21.5	22.7	22.4
Nb/La	0.86	0.81	0.86	0.83	0.84	1.19	1.03	1.25	1.13	1.09	1.15	1.04	1.18	0.76	0.77	0.73
Nb/U	26.5	25.8	29.0	28.6	29.2	36.7	45.6	40.6	47.0	48.5	47.5	36.3	47.3	24.6	24.8	23.7

Table S3: Continuted

Location	Xichang dike				Yanbian dike										
Sample	XC06-26	XC07-27	XC07-28	XC07-29	04HS-09	HT-01	HT-02	HT-03	HT-04	HT-05	DW-01	07DW-01	XC03-11	XC03-12	XC03-13
Rock type	Alkaine mafic rock				Alkaine mafic rock										
Reference	Li et al., 2019				Zhu et al., 2008										
Age(Ma)		791			792								785		
Major(wt.%)															
SiO_2	47.62	50.75	51.08	50.60	48.02	47.10	47.01	49.73	47.36	46.64	47.40	48.38	48.47	45.76	45.21
TiO_2	3.96	3.75	3.76	3.70	2.57	2.58	2.73	2.04	2.66	2.36	2.03	2.39	2.74	2.59	2.87
Al_2O_3	13.60	13.57	13.26	13.37	12.63	13.63	14.22	14.64	13.79	12.18	12.21	12.26	13.40	14.01	13.79
Fe2O3T	12.51	12.32	12.30	12.18	12.86	12.50	12.36	11.66	13.69	12.30	11.30	12.29	13.60	12.55	13.40
Fe_2O_3															
FeO															
MnO	0.18	0.17	0.17	0.16	0.34	0.38	0.46	0.52	0.38	0.21	0.16	0.16	0.27	0.22	0.24
MgO	4.77	4.04	4.13	4.13	8.67	6.78	8.53	7.21	8.72	8.83	10.09	8.80	5.10	5.30	5.53
CaO	8.52	7.69	7.77	8.07	9.57	8.74	5.95	5.38	6.91	10.33	10.32	8.93	7.33	12.50	11.27
Na_2O	2.56	2.35	2.18	2.08	2.34	3.57	3.32	3.00	2.56	2.11	2.09	2.46	3.43	2.22	2.48
K_2O	1.69	1.93	1.96	1.96	1.13	1.06	1.09	1.76	1.10	0.64	0.84	1.12	1.88	0.86	0.67
P_2O_5	0.59	0.43	0.43	0.42	0.25	0.29	0.32	0.39	0.31	0.26	0.23	0.28	0.51	0.39	0.45
LOI	2.43	1.26	1.78	1.58	2.83	3.08	3.31	3.23	2.70	2.63	2.53	2.87	1.38	1.65	1.82
TOL	98.43	98.91	99.35	98.69	101.21	99.71	99.31	99.56	100.17	98.49	99.20	99.94	98.11	98.05	97.73
Trace(ppm)															
Li															
Be															
Sc	27.0	29.0	28.0	30.0	29.6	24.5	23.2	23.2	25.8	28.3	31.5	32.3	27.0	25.0	29.0
V	385	381	355	386	319	309	295	228	300	306	238	329	344	379	388
Cr	32.0	30.0	29.0	32.0	438	221	139	210	227	471	637	547	36.0	72.0	66.0
Co	44.0	44.0	42.0	45.0	55.4	47.6	67.7	53.7	85.9	58.4	59.1	71.6	36.0	42.0	47.0
Ni	64.0	40.0	39.0	43.0	135	88.6	80.4	104	116	167	197	179	38.0	55.0	57.0
Cu	145	185	177	196	113	80.9	80.9	56.7	88.9	107	120	116	58.0	103	100
Zn	143	136	136	151	121	102	76.3	67.2	123	112	95.1	128	135	104	123

Table S3: Continuted

Location	Xichang dike				Yanbian dike										
Sample	XC06-26	XC07-27	XC07-28	XC07-29	04HS-09	HT-01	HT-02	HT-03	HT-04	HT-05	DW-01	07DW-01	XC03-11	XC03-12	XC03-13
Rock type	Alkaine mafic rock				Alkaine mafic rock										
Reference	Li et al., 2019				Zhu et al., 2008										
Age(Ma)		791						792						785	
Ga					18.2	20.1	20.9	18.9	20.8	18.4	16.0	22.5			
Ge															
Rb	32.0	81.0	84.0	80.0	21.8	18.8	21.2	33.4	24.2	11.5	14.5	19.5	52.0	17.0	18.0
Sr	738	435	463	462	358	414	388	385	451	423	317	265	277	806	798
Y	33.0	35.0	35.0	37.0	23.1	25.4	27.1	30.2	27.3	23.6	21.3	29.8	28.0	19.0	23.0
Zr	364	368	357	369	189	222	249	234	241	195	162	241	157	101	117
Nb	36.0	37.0	37.0	37.0	20.7	24.2	26.3	21.9	25.9	21.5	15.5	22.6	21.0	13.0	17.0
Sn															
Cs					0.83	0.46	0.44	0.75	1.03	0.77	0.56	0.64			
Ba	590	484	482	487	421	320	368	590	387	262	256	430	793	246	324
La	47.0	49.0	47.0	48.0	24.8	27.4	30.6	29.8	29.6	26.3	17.1	25.3	31.0	20.0	23.0
Ce	109	114	111	112	54.3	61.5	64.8	63.9	62.9	56.8	37.8	57.9	61.0	42.0	49.0
Pr	15.0	15.0	15.0	15.0	7.00	7.93	8.45	8.46	8.22	7.33	5.32	7.79	8.00	6.00	6.00
Nd	63.0	61.0	61.0	63.0	32.5	35.7	34.4	35.8	33.8	33.3	25.4	33.7	38.0	26.0	28.0
Sm	12.0	12.0	11.0	12.0	7.10	7.71	7.35	8.04	7.38	7.25	5.75	7.61	8.00	6.00	6.00
Eu	3.44	3.12	3.01	3.07	1.88	2.13	2.40	2.20	2.41	1.90	1.65	2.32	2.77	2.09	2.38
Gd	10.5	10.8	9.89	10.3	5.81	6.24	6.07	7.01	6.27	5.90	4.99	6.92	8.04	5.82	6.93
Tb	1.43	1.50	1.42	1.46	0.86	0.93	0.98	1.08	0.98	0.88	0.75	1.15	1.05	0.77	0.86
Dy	7.90	8.49	7.87	8.36	5.09	5.28	5.50	6.35	5.68	5.20	4.65	5.91	5.82	4.21	4.73
Ho	1.39	1.51	1.41	1.45	0.91	0.99	1.06	1.23	1.07	0.91	0.80	1.20	1.13	0.76	0.88
Er	3.46	3.97	3.72	3.80	2.35	2.63	2.66	3.16	2.75	2.40	2.06	2.87	2.96	2.10	2.33
Tm	0.49	0.58	0.53	0.53	0.32	0.39	0.36	0.44	0.38	0.35	0.30	0.40	0.39	0.27	0.29
Yb	2.73	3.36	3.09	3.29	1.97	2.33	2.09	2.70	2.15	2.03	1.73	2.41	2.51	1.70	1.89
Lu	0.38	0.50	0.45	0.47	0.29	0.31	0.30	0.38	0.30	0.29	0.24	0.33	0.35	0.24	0.28
Hf	9.37	9.64	9.49	9.68	4.48	5.01	6.42	6.38	6.23	4.75	4.00	5.69	4.21	2.80	3.21
Ta	2.28	2.44	2.39	2.40	1.17	1.37	1.63	1.37	1.64	1.19	0.94	1.46	1.50	1.02	1.17

Table S3: Continuted

Location	Xichang dike				Yanbian dike										
Sample	XC06-26	XC07-27	XC07-28	XC07-29	04HS-09	HT-01	HT-02	HT-03	HT-04	HT-05	DW-01	07DW-01	XC03-11	XC03-12	XC03-13
Rock type	Alkaine mafic rock				Alkaine mafic rock										
Reference	Li et al., 2019				Zhu et al., 2008										
Age(Ma)		791			792								785		
Pb	7.11	5.63	7.60	7.65	3.93	3.06	11.6	7.58	4.53	4.63	2.31	4.53	4.06	6.94	5.06
Th	6.62	9.43	8.72	9.08	3.08	3.73	3.56	4.17	3.51	3.38	2.11	3.05	3.15	1.83	2.03
U	1.52	2.08	1.99	2.03	0.73	0.89	0.85	1.22	0.82	0.80	0.54	0.69	0.79	0.54	0.48
Isotopic date															
$^{87}Sr/^{86}Sr$ (t)		0.703296		0.703504									0.705299	0.705431	0.704186
$\varepsilon_{Nd\ (t)}$		2.8		2.28	5.75	6.29				5.77	7.18		1.04	0.77	1.79
Ratio															
Mg#	47.1	43.3	43.9	44.1	61.1	55.8	61.7	59.0	59.7	62.6	67.5	62.5	46.6	49.6	49.0
Sr/Y	22.4	12.4	13.2	12.5	15.5	16.3	14.3	12.7	16.5	17.9	14.9	8.89	9.89	42.4	34.7
Nb/La	0.77	0.76	0.79	0.77	0.83	0.88	0.86	0.73	0.88	0.82	0.91	0.89	0.68	0.65	0.74
Nb/U	23.7	17.8	18.6	18.2	28.4	27.2	30.9	18.0	31.6	26.9	28.7	32.8	26.6	24.1	35.4

Table S3: Continuted

Location	Xichang dike				Datian dike											
Sample	XC04-14	XC04-15	XC04-16	XC04-17	DT1206	DT1413	DT1414	DT1415	11DT01	DT1201	DT1202	DT1203	DT1401	DT1402	DT1403	DT1404
Rock type	Alkaine mafic rock				Alkaine mafic rock											
Reference	Li et al., 2019				Yang et al., 2017											
Age(Ma)	772				760											
Major(wt.%)																
SiO_2	44.97	45.34	45.20	45.07	42.27	42.70	42.20	43.00	48.66	46.48	47.95	48.13	48.30	47.90	48.20	48.30
TiO_2	4.45	4.60	4.60	4.61	1.73	1.77	1.76	1.82	2.40	2.56	2.27	2.29	2.29	2.26	2.27	2.23
Al_2O_3	10.91	11.04	11.03	11.01	4.96	5.06	5.00	5.25	14.01	12.16	13.55	13.66	13.70	13.60	13.55	13.90
Fe2O3T	12.19	12.38	12.37	12.39	13.76	13.74	13.76	13.76	12.24	13.55	12.30	12.22	12.34	12.30	12.10	11.97
Fe_2O_3																
FeO																
MnO	0.15	0.16	0.16	0.16	0.18	0.18	0.18	0.17	0.18	0.17	0.18	0.18	0.18	0.18	0.18	0.17
MgO	8.45	8.06	8.24	8.36	22.40	21.80	21.90	21.60	6.23	8.65	6.90	6.84	6.74	6.66	6.76	6.39
CaO	11.57	11.33	11.07	11.33	7.92	8.28	7.85	7.94	9.59	9.95	10.16	9.86	9.92	9.51	9.82	9.47
Na_2O	1.10	1.32	1.41	1.39	0.60	0.61	0.62	0.65	2.65	2.59	2.53	2.71	2.56	2.48	2.84	2.58
K_2O	1.59	1.55	1.43	1.39	0.22	0.23	0.22	0.21	1.15	0.85	1.00	1.24	1.03	1.08	1.21	1.26
P_2O_5	0.30	0.31	0.32	0.32	0.16	0.16	0.16	0.16	0.25	0.30	0.25	0.27	0.25	0.25	0.25	0.25
LOI	2.11	1.92	1.87	1.91	5.21	4.60	4.80	4.34	1.87	2.28	2.41	2.24	2.30	2.14	1.92	1.93
TOL	98.29	98.53	98.23	98.42	99.41	99.13	98.45	98.90	99.24	99.54	99.50	99.64	99.61	98.36	99.10	98.45
Trace(ppm)																
Li																
Be																
Sc	40.0	36.0	34.0	36.0	11.3	35.7	33.9	35.1	27.7	33.0	29.6	29.2	36.7	36.8	37.4	34.4
V	408	418	398	433	191	245	236	238	230	236	239	238	314	314	312	315
Cr	451	406	365	411	1960	2260	2230	2170	64.0	267	101	99.0	108	108	107	84.0
Co	57.0	53.0	56.0	62.0	119	115	118	117	48.6	51.1	48.3	47.5	47.6	47.9	46.5	45.7
Ni	198	181	198	202	726	1340	1470	1310	46.8	140	91.0	82.9	114	116	112	95.8
Cu	204	218	318	340	81.7	129	117	116	96.1	115	139	123	185	152	151	124
Zn	112	121	118	118	165	148	147	135	174	159	132	149	114	118	124	118

Table S3: Continuted

Location	Xichang dike				Datian dike											
Sample	XC04-14	XC04-15	XC04-16	XC04-17	DT1206	DT1413	DT1414	DT1415	11DT01	DT1201	DT1202	DT1203	DT1401	DT1402	DT1403	DT1404
Rock type	Alkaine mafic rock				Alkaine mafic rock											
Reference	Li et al., 2019				Yang et al., 2017											
Age(Ma)	772				760											
Ga					9.64	9.87	9.72	9.78	19.7	18.4	19.6	19.7	20.2	20.4	19.8	20.7
Ge																
Rb	56.0	47.0	42.0	45.0	8.69	8.48	7.29	4.80	36.4	23.4	35.2	41.2	33.6	32.7	41.0	44.2
Sr	461	497	547	576	168	170	173	172	576	535	546	515	593	560	520	572
Y	24.0	25.0	28.0	33.0	15.3	15.8	12.7	12.2	23.2	24.1	23.1	23.0	23.7	23.6	23.3	23.6
Zr	294	294	294	320	87.7	93.4	91.4	98.9	183	215	186	186	188	191	187	200
Nb	23.0	24.0	22.0	24.0	15.4	15.0	14.5	15.4	29.4	30.2	27.9	28.9	26.9	26.5	26.8	26.8
Sn																
Cs					2.87	2.79	2.63	1.47	0.53	0.14	0.37	0.69	0.39	0.30	0.46	0.85
Ba	331	780	787	702	594	650	603	148	673	641	310	379	451	346	524	395
La	37.0	40.0	50.0	48.0	17.5	17.3	16.0	15.7	35.6	30.7	31.1	32.2	32.1	31.9	30.8	31.8
Ce	72.0	79.0	84.0	83.0	32.7	35.2	34.6	35.3	71.6	65.1	64.3	66.3	68.6	68.6	66.9	69.0
Pr	11.0	11.0	14.0	13.0	4.94	4.50	4.41	4.24	8.16	8.85	8.06	8.38	7.90	8.15	7.84	8.10
Nd	48.0	49.0	62.0	58.0	20.5	18.2	18.0	17.4	31.8	34.8	31.0	32.4	32.5	31.9	31.0	32.0
Sm	10.0	11.0	13.0	12.0	4.46	3.55	3.70	3.68	6.19	7.65	6.52	6.44	6.15	6.13	5.81	6.11
Eu	2.90	3.06	3.78	3.53	1.47	1.16	1.13	1.02	1.93	2.45	2.08	2.11	2.10	1.93	1.93	2.04
Gd	9.21	9.59	11.1	11.0	4.54	3.41	3.60	3.38	6.15	6.94	6.30	6.56	5.95	5.23	5.64	5.41
Tb	1.13	1.21	1.31	1.36	0.69	0.54	0.49	0.49	0.84	1.06	0.93	0.95	0.87	0.85	0.89	0.87
Dy	5.69	6.18	6.97	6.96	3.40	2.84	2.78	2.43	4.76	5.10	4.61	4.56	4.76	4.64	4.60	4.46
Ho	0.94	0.97	1.17	1.20	0.68	0.53	0.50	0.46	0.89	1.04	0.97	0.96	0.92	0.87	0.90	0.90
Er	2.33	2.49	2.65	2.98	1.77	1.35	1.32	1.23	2.30	2.57	2.40	2.44	2.40	2.43	2.38	2.40
Tm	0.29	0.31	0.36	0.38	0.22	0.19	0.16	0.15	0.30	0.32	0.32	0.33	0.33	0.33	0.33	0.31
Yb	1.81	1.88	2.16	2.16	1.40	1.09	1.05	0.88	1.87	2.03	1.95	2.06	2.09	2.00	2.01	2.02
Lu	0.24	0.26	0.29	0.30	0.19	0.13	0.12	0.12	0.27	0.30	0.29	0.30	0.28	0.27	0.29	0.28
Hf	7.07	7.17	7.23	7.68	2.72	2.41	2.19	2.38	5.04	5.83	5.31	5.42	4.41	4.44	4.51	4.56
Ta	1.70	1.80	1.80	1.87	0.97	0.84	0.84	0.95	1.42	1.81	1.63	1.74	1.51	1.50	1.49	1.48

Table S3: Continuted

Location	Xichang dike				Datian dike											
Sample	XC04-14	XC04-15	XC04-16	XC04-17	DT1206	DT1413	DT1414	DT1415	11DT01	DT1201	DT1202	DT1203	DT1401	DT1402	DT1403	DT1404
Rock type	Alkaine mafic rock				Alkaine mafic rock											
Reference	Li et al., 2019				Yang et al., 2017											
Age(Ma)	772				760											
Pb	4.56	8.41	5.42	5.24	2.17	0.85	0.70	0.81	6.24	4.95	5.88	6.66	4.65	4.04	5.07	3.76
Th	4.56	4.90	4.89	4.88	1.91	1.85	1.84	1.91	4.03	3.55	4.13	4.22	3.95	3.96	3.73	4.02
U	0.92	0.94	1.02	0.98	0.50	0.41	0.41	0.48	0.94	1.11	0.89	0.93	0.88	0.93	1.15	0.87
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)		0.704229		0.704332												
$\varepsilon_{Nd\ (t)}$		2.19		2.32	3			4.4			4.8			4.3		
Ratio																
Mg#	61.8	60.3	60.8	61.1	79.1	78.7	78.8	78.5	54.3	59.8	56.7	56.6	56.0	55.8	56.6	55.4
Sr/Y	19.2	19.9	19.5	17.5	11.0	10.8	13.6	14.1	24.8	22.2	23.6	22.4	25.0	23.7	22.3	24.2
Nb/La	0.62	0.60	0.44	0.50	0.88	0.87	0.91	0.98	0.83	0.98	0.90	0.90	0.84	0.83	0.87	0.84
Nb/U	25.0	25.5	21.6	24.5	30.8	36.6	35.4	32.1	31.3	27.2	31.3	31.1	30.6	28.5	23.3	30.8

Table S3: Continuted

Location	Xichang dike														
Sample	DT1405	DT1406	DT1407	XC05-18	XC05-19	XC05-20	XC05-21	XC05-22	XC01-01	XC01-02	XC01-03	XC01-04	XC01-05	XC01-06	XC02-07
Rock type	Alkaine mafic rock														
Reference	Li et al., 2019														
Age(Ma)	760								751						
Major(wt.%)															
SiO_2	48.50	48.70	48.80	50.42	49.98	50.29	49.68	50.33	48.73	50.03	48.84	49.68	50.14	50.12	50.10
TiO_2	2.28	2.04	1.96	1.94	1.92	1.99	1.98	2.01	3.42	3.61	3.70	3.74	3.50	3.49	2.08
Al_2O_3	13.60	13.45	11.05	14.21	14.14	14.35	14.47	14.38	12.54	11.89	12.13	12.06	11.70	12.09	13.58
Fe2O3T	12.20	12.60	12.04	10.49	10.25	10.66	10.35	10.64	10.97	10.46	10.97	10.65	10.87	10.98	14.17
Fe_2O_3															
FeO															
MnO	0.18	0.18	0.17	0.16	0.16	0.16	0.16	0.17	0.17	0.16	0.18	0.15	0.17	0.16	0.19
MgO	6.81	7.35	9.59	6.51	6.25	6.36	6.06	6.46	7.05	6.74	7.06	6.62	7.11	6.94	4.27
CaO	9.81	9.75	10.70	8.30	9.13	8.70	9.25	8.76	7.30	7.58	7.55	7.56	7.16	7.63	7.54
Na_2O	2.69	2.54	2.29	2.96	2.49	2.66	3.16	2.65	1.57	1.38	1.75	1.59	1.98	1.88	3.01
K_2O	1.26	0.63	0.69	1.34	1.62	1.50	0.80	1.52	4.05	4.44	3.53	3.99	3.53	2.97	0.03
P_2O_5	0.26	0.21	0.18	0.22	0.21	0.22	0.22	0.22	0.26	0.37	0.38	0.41	0.39	0.41	0.14
LOI	1.89	1.73	2.09	2.23	1.82	1.94	2.54	2.13	2.46	2.51	2.36	2.54	2.19	2.40	3.01
TOL	99.48	99.18	99.56	98.78	97.97	98.83	98.67	99.27	98.52	99.17	98.45	98.99	98.74	99.07	98.12
Trace(ppm)															
Li															
Be															
Sc	36.7	37.1	43.7	31.0	32.0	32.0	31.0	30.0	27.0	27.0	27.0	28.0	28.0	28.0	31.0
V	312	334	309	354	314	351	348	345	307	295	307	307	299	302	383
Cr	126	296	614	131	133	96.0	81.0	78.0	372	326	333	336	347	333	14.0
Co	46.8	52.5	54.3	47.0	43.0	47.0	46.0	46.0	41.0	47.0	47.0	46.0	48.0	47.0	42.0
Ni	123	142	260	99.0	94.0	95.0	92.0	82.0	125	131	129	130	136	129	37.0
Cu	172	113	176	123	117	131	134	133	115	133	132	122	131	131	166
Zn	124	123	99.9	107	87.0	105	99.0	101	119	119	119	123	121	115	130

Table S3: Continuted

Location	Xichang dike														
Sample	DT1405	DT1406	DT1407	XC05-18	XC05-19	XC05-20	XC05-21	XC05-22	XC01-01	XC01-02	XC01-03	XC01-04	XC01-05	XC01-06	XC02-07
Rock type	Alkaine mafic rock														
Reference	Li et al., 2019														
Age(Ma)	760								751						
Ga	20.2	20.3	17.2												
Ge															
Rb	37.7	22.0	17.0	54.0	59.0	59.0	18.0	48.0	82.0	88.0	77.0	83.0	75.0	69.0	5.00
Sr	571	503	391	565	481	525	506	494	370	335	354	350	355	356	340
Y	24.3	21.7	20.0	23.0	22.0	25.0	23.0	22.0	25.0	28.0	28.0	28.0	29.0	30.0	37.0
Zr	195	171	157	144	143	144	149	150	376	339	351	350	346	343	188
Nb	27.6	15.4	17.8	12.0	12.0	13.0	12.0	12.0	47.0	37.0	39.0	39.0	38.0	38.0	29.0
Sn															
Cs	0.74	0.59	0.36												
Ba	386	270	304	392	454	651	255	387	1530	1830	1610	1920	1300	1230	1010
La	32.4	22.0	24.0	20.0	21.0	21.0	21.0	20.0	50.0	56.0	56.0	58.0	56.0	56.0	28.0
Ce	69.3	50.7	54.0	45.0	46.0	47.0	48.0	47.0	104	125	126	131	124	122	51.0
Pr	8.11	6.19	6.37	7.00	7.00	7.00	7.00	7.00	14.0	16.0	16.0	17.0	16.0	17.0	8.00
Nd	32.5	26.1	26.3	30.0	31.0	32.0	33.0	32.0	56.0	64.0	66.0	68.0	65.0	66.0	33.0
Sm	6.32	5.52	5.11	6.00	6.00	6.00	6.00	6.00	10.0	12.0	12.0	13.0	12.0	12.0	7.00
Eu	2.09	1.81	1.67	1.76	1.84	1.89	1.86	1.85	2.87	3.40	3.43	3.68	3.38	3.47	2.21
Gd	5.81	5.06	4.96	5.90	5.84	6.18	6.04	5.87	8.19	9.72	9.91	9.82	9.93	9.95	7.69
Tb	0.87	0.82	0.72	0.85	0.87	0.90	0.86	0.84	1.03	1.36	1.39	1.43	1.42	1.43	1.20
Dy	4.58	4.36	4.07	5.06	5.02	5.14	5.02	5.19	5.17	6.54	6.51	6.74	6.51	6.91	7.19
Ho	0.92	0.82	0.77	0.94	0.94	0.98	0.96	0.94	0.87	1.18	1.15	1.21	1.16	1.24	1.40
Er	2.37	2.27	1.89	2.47	2.45	2.62	2.54	2.47	2.36	2.89	2.89	3.00	2.96	3.04	4.25
Tm	0.32	0.29	0.24	0.37	0.36	0.39	0.36	0.36	0.32	0.39	0.41	0.41	0.40	0.42	0.63
Yb	2.10	1.78	1.57	2.09	2.11	2.30	2.22	2.07	1.83	2.24	2.27	2.35	2.32	2.38	3.94
Lu	0.31	0.25	0.23	0.33	0.32	0.34	0.32	0.32	0.25	0.34	0.34	0.35	0.36	0.36	0.58
Hf	4.48	4.30	3.96	4.48	4.55	4.60	4.74	4.74	7.03	9.51	9.70	10.0	9.60	9.59	4.81
Ta	1.59	0.93	1.06	0.76	0.78	0.81	0.80	0.82	2.53	2.53	2.59	2.68	2.56	2.57	2.43

Table S3: Continuted

Location	Xichang dike														
Sample	**DT1405**	**DT1406**	**DT1407**	**XC05-18**	**XC05-19**	**XC05-20**	**XC05-21**	**XC05-22**	**XC01-01**	**XC01-02**	**XC01-03**	**XC01-04**	**XC01-05**	**XC01-06**	**XC02-07**
Rock type				**Alkaine mafic rock**											
Reference	**Li et al., 2019**														
Age(Ma)				**760**					**751**						
Pb	5.32	2.81	8.97	6.63	3.87	4.99	6.22	5.11	7.39	8.87	7.78	17.0	5.49	7.84	4.86
Th	3.92	2.30	3.25	2.18	2.32	2.52	2.42	2.42	7.13	8.33	8.41	8.62	8.30	8.37	4.41
U	0.80	0.46	0.66	0.53	0.54	0.56	0.60	0.55	1.36	1.56	1.61	1.63	1.58	1.58	1.01
Isotopic date															
$^{87}Sr/^{86}Sr$ (t)				0.703210		0.703435		0.703452	0.702097	0.701859	0.701487				0.706143
$\varepsilon_{Nd\ (t)}$		5.2		2.6		3.37		3.12	1.9	2.8	2.8				5.4
Ratio															
Mg#	56.5	57.6	65.0	59.1	58.7	58.2	57.7	58.6	60.0	60.0	60.0	59.2	60.4	59.6	41.3
Sr/Y	23.5	23.2	19.6	24.6	21.9	21.0	22.0	22.5	14.8	12.0	12.6	12.5	12.2	11.9	9.19
Nb/La	0.85	0.70	0.74	0.60	0.57	0.62	0.57	0.60	0.94	0.66	0.70	0.67	0.68	0.68	1.04
Nb/U	34.5	33.5	27.0	22.6	22.2	23.2	20.0	21.8	34.6	23.7	24.2	23.9	24.1	24.1	28.7

Table S3: Continuted

Location	Tongde dike														
Sample	XC02-08	XC02-09	XC02-10	TBZ1-0701	TBZ1-0702	TBZ1-0703	TBZ1-0704	TBZ1-0705	TBZ0600	TBZ0601	TBZ0602	TBZ0603	TBZ0604	TBZ0605	SC02-1	SC02-2
Rock type	Alkaine mafic rock															
Reference	Li et al., 2010															
Age(Ma)	743			796											848	
Major(wt.%)																
SiO_2	50.14	50.44	49.75	44.35	44.37	44.30	44.42	43.33	45.59	43.52	42.52	44.23	43.61	44.24	49.59	50.94
TiO_2	2.17	2.15	2.24	1.75	1.83	1.77	1.77	1.57	2.09	1.69	1.60	1.77	1.78	1.72	0.62	1.29
Al_2O_3	13.35	13.69	13.25	7.77	7.97	7.87	7.85	7.14	9.19	7.42	7.12	7.91	7.97	7.75	19.58	16.42
Fe2O3T	14.35	14.32	14.88	13.60	13.46	13.61	13.50	13.55	13.12	13.37	13.42	13.43	13.49	13.65	8.71	10.95
Fe_2O_3															4.75	5.06
FeO															3.56	5.30
MnO	0.21	0.22	0.23	0.15	0.15	0.15	0.15	0.15	0.15	0.14	0.14	0.15	0.15	0.15	0.20	0.17
MgO	4.29	4.57	4.48	21.42	20.38	21.04	20.80	23.19	17.30	21.17	21.97	20.60	20.66	21.44	2.75	5.24
CaO	8.17	7.90	7.28	8.06	8.35	8.04	8.12	7.29	9.55	7.37	7.26	7.70	7.72	7.56	10.21	8.39
Na_2O	2.69	3.48	2.89	1.31	1.36	1.32	1.33	1.16	1.60	1.20	1.08	1.32	1.33	1.30	3.50	2.80
K_2O	0.41	0.24	0.46	0.30	0.29	0.30	0.29	0.27	0.35	0.22	0.20	0.26	0.26	0.26	0.57	0.58
P_2O_5	0.25	0.21	0.25	0.16	0.16	0.16	0.16	0.14	0.17	0.15	0.14	0.16	0.16	0.15	0.48	0.31
LOI	2.56	1.83	2.88	1.99	2.22	1.90	1.99	2.63	1.24	2.45	3.56	1.38	1.55	1.61	3.63	2.87
TOL	98.59	99.05	98.59	100.85	100.54	100.46	100.38	100.42	100.35	98.71	99.02	98.90	98.68	99.83	99.44	99.37
Trace(ppm)																
Li															12.5	11.1
Be															1.36	1.10
Sc	35.0	35.0	34.0	22.0	23.1	22.8	23.5	21.3	32.5	23.7	23.4	24.3	23.5	24.0	11.8	40.2
V	404	398	388	245	254	251	257	234	357	256	231	269	271	259	103	307
Cr	13.0	16.0	15.0	1500	1530	1580	1510	1740	1630	1840	1650	1810	1860	1840	46.6	91.7
Co	49.0	51.0	48.0	87.5	85.3	87.6	87.5	94.8	92.8	95.5	99.5	92.0	94.1	94.3	46.5	36.3
Ni	40.0	41.0	45.0	872	844	881	875	1040	807	1060	1140	1020	1040	1080	10.4	28.6
Cu	166	187	171												5.04	28.9
Zn	127	132	144												89.5	108

Table S3: Continuted

Location	Tongde dike														
Sample	XC02-08	XC02-09	XC02-10	TBZ1-0701	TBZ1-0702	TBZ1-0703	TBZ1-0704	TBZ1-0705	TBZ0600	TBZ0601	TBZ0602	TBZ0603	TBZ0604	TBZ0605	SC02-1	SC02-2
Rock type	Alkaine mafic rock															
Reference	Li et al., 2010															
Age(Ma)	743			796											848	
Ga				12.8	13.7	13.1	13.5	11.5	18.4	12.7	12.4	13.4	13.9	12.8	27.6	22.7
Ge																
Rb	14.0	6.00	15.0	5.73	5.48	5.72	6.21	5.26	7.48	6.21	7.05	6.78	7.13	6.65	22.1	18.5
Sr	426	331	295	252	259	255	263	229	377	218	212	235	241	241	654	582
Y	39.0	35.0	43.0	14.9	15.3	15.4	15.2	12.9	20.8	15.1	14.6	15.4	16.0	15.4	30.0	28.7
Zr	189	182	184	110	110	114	118	100	156	124	119	130	133	128	125	114
Nb	26.0	25.0	26.0	12.5	12.5	13.0	13.5	11.5	18.4	13.8	13.3	14.5	15.1	14.5	3.34	4.11
Sn															0.82	1.14
Cs				0.62	0.75	0.65	0.73	0.64	1.17	1.00	1.12	0.72	0.72	0.68	1.61	1.11
Ba	942	722	438	94.3	83.7	88.5	91.3	93.4	123	71.8	80.2	81.4	83.5	89.3	324	379
La	33.0	30.0	37.0	13.2	13.5	13.5	13.5	11.5	18.0	12.5	12.3	13.2	13.6	13.1	26.1	20.5
Ce	62.0	61.0	63.0	29.3	29.9	29.9	30.2	25.6	39.9	27.3	27.2	29.2	29.7	29.6	57.8	44.9
Pr	9.00	8.00	10.0	4.03	4.10	4.10	4.12	3.53	5.47	3.79	3.74	4.06	4.10	3.99	7.44	5.68
Nd	38.0	35.0	43.0	17.6	18.1	18.1	18.3	15.9	24.5	16.8	16.4	17.7	18.1	18.0	30.9	23.8
Sm	8.00	7.00	9.00	3.99	4.25	4.20	4.23	3.68	5.64	3.99	3.89	4.40	4.49	4.29	6.35	5.49
Eu	2.49	2.31	2.73	1.31	1.36	1.37	1.39	1.20	1.94	1.42	1.35	1.49	1.57	1.47	2.01	1.80
Gd	7.82	7.03	9.08	3.84	4.10	3.97	4.09	3.54	5.44	3.50	3.55	3.70	3.94	3.76	5.64	5.49
Tb	1.39	1.25	1.54	0.61	0.61	0.62	0.62	0.55	0.85	0.57	0.57	0.62	0.63	0.62	0.84	0.86
Dy	7.63	6.89	8.62	3.12	3.31	3.28	3.34	2.79	4.61	3.32	3.29	3.57	3.67	3.54	4.60	5.08
Ho	1.55	1.43	1.75	0.62	0.64	0.66	0.66	0.57	0.93	0.61	0.61	0.64	0.67	0.65	0.96	1.01
Er	4.43	3.95	4.89	1.56	1.57	1.59	1.54	1.35	2.12	1.48	1.49	1.61	1.68	1.63	2.95	2.99
Tm	0.66	0.61	0.73	0.18	0.19	0.20	0.20	0.16	0.27	0.20	0.21	0.22	0.22	0.23	0.41	0.38
Yb	4.00	3.66	4.35	1.14	1.18	1.25	1.16	1.03	1.60	1.19	1.13	1.24	1.24	1.26	2.99	2.73
Lu	0.64	0.57	0.69	0.16	0.17	0.16	0.15	0.15	0.23	0.15	0.15	0.16	0.17	0.16	0.45	0.39
Hf	5.38	5.27	5.47	2.70	2.77	2.92	3.10	2.64	4.17	3.29	3.14	3.47	3.58	3.46	4.61	3.00
Ta	1.69	1.66	1.72	0.80	0.79	0.83	0.90	0.76	1.25	0.87	0.83	0.94	0.92	0.94	0.15	0.25

Table S3: Continuted

Location	Tongde dike														
Sample	XC02-08	XC02-09	XC02-10	TBZ1-0701	TBZ1-0702	TBZ1-0703	TBZ1-0704	TBZ1-0705	TBZ0600	TBZ0601	TBZ0602	TBZ0603	TBZ0604	TBZ0605	SC02-1	SC02-2
Rock type	Alkaine mafic rock															
Reference	Li et al., 2010															
Age(Ma)	743			796											848	
Pb	6.36	4.61	4.67	0.67	1.00	0.70	2.61	0.78	1.33	3.00	1.49	1.45	1.74	1.78	5.76	7.21
Th	4.40	4.32	4.44	1.41	1.38	1.43	1.49	1.30	1.93	1.36	1.38	1.48	1.54	1.48	3.64	4.36
U	1.00	1.00	0.98	0.37	0.39	0.38	0.40	0.38	0.51	0.34	0.38	0.37	0.39	0.38	0.54	0.98
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)	0.705703	0.705594														
$\varepsilon_{Nd\ (t)}$	6.2	6.5		8.38	7.79			8.33	8.20	8.43	8.64		8.67			
Ratio																
Mg#	41.1	42.7	41.2	78.6	77.9	78.3	78.2	80.0	75.4	78.7	79.2	78.1	78.1	78.5	42.4	52.7
Sr/Y	10.9	9.46	6.86	16.9	16.9	16.6	17.3	17.8	18.1	14.4	14.5	15.3	15.1	15.6	21.8	20.3
Nb/La	0.79	0.83	0.70	0.95	0.93	0.96	1.00	1.00	1.02	1.10	1.08	1.10	1.11	1.11	0.13	0.20
Nb/U	26.0	25.0	26.5	34.0	32.0	34.7	33.8	30.1	35.8	40.6	35.3	39.7	38.6	38.6	6.19	4.19

Table S3: Continuted

Location	Baoxing intrusion															
Sample	SC01-4	SC01-5	SC01-6	SC01-7	SC09-1	SC09-2	SC09-3	SC10-1	CX411-1	CX412-1	CX484-1	CX484-3	CX485-1	CX485-2	CX486-1	CX486-2
Rock type	Sub alkaline mafic rock								Sub alkaline mafic rock							
Reference	Meng et al., 2015								Du et al., 2014							
Age(Ma)	799						802		856							
Major(wt.%)																
SiO_2	57.62	54.29	47.67	55.48	48.59	53.58	50.85	49.16	49.87	47.02	54.86	53.25	50.90	47.80	51.50	53.74
TiO_2	0.56	0.78	0.77	0.62	0.77	0.92	1.42	1.63	0.47	0.48	0.35	0.37	0.44	0.48	0.51	0.46
Al_2O_3	18.04	16.33	17.74	18.23	18.26	17.82	17.09	16.85	18.89	18.79	19.52	20.13	20.07	20.80	18.74	18.77
Fe2O3T	6.70	8.61	10.12	7.28	9.82	8.66	10.85	11.88	10.29	9.26	6.80	7.39	9.04	9.73	8.67	8.08
Fe_2O_3	3.70	2.69	3.80	3.55	3.58	3.63	3.78	3.80								
FeO	2.70	5.33	5.69	3.36	5.62	4.53	6.36	7.27								
MnO	0.19	0.31	0.29	0.24	0.29	0.22	0.17	0.17	0.18	0.17	0.19	0.19	0.17	0.21	0.17	0.19
MgO	3.00	5.47	7.50	3.26	6.09	3.84	4.74	5.18	4.85	7.50	2.88	3.07	3.84	4.20	3.08	3.73
CaO	6.68	7.42	8.64	7.22	8.80	7.78	8.62	9.10	9.69	11.17	8.80	8.12	9.93	9.92	11.88	9.39
Na_2O	3.56	3.02	3.13	3.31	3.31	3.29	3.30	3.23	2.39	1.85	3.08	3.30	2.87	3.31	2.44	3.19
K_2O	1.24	1.11	0.73	1.59	0.81	1.40	1.00	0.94	0.63	0.42	0.83	1.33	0.59	1.01	0.42	0.74
P_2O_5	0.34	0.24	0.20	0.36	0.21	0.33	0.27	0.25	0.09	0.08	0.10	0.09	0.09	0.09	0.10	0.11
LOI	2.01	2.15	3.14	1.99	2.94	1.77	1.39	1.24	2.13	2.68	2.01	2.15	2.10	1.97	2.23	1.04
TOL	99.64	99.14	99.30	99.21	99.27	99.11	98.99	98.82	99.48	99.42	99.40	99.38	100.04	99.53	99.70	99.43
Trace(ppm)																
Li	7.22	8.32	13.6	6.96	12.5	7.25	7.77	7.91								
Be	1.64	1.66	0.85	1.77	1.01	1.45	0.88	0.69								
Sc	14.1	33.8	46.8	14.6	44.2	21.2	32.0	36.5	20.3	24.0	12.7	15.6	23.3	23.4	28.4	26.1
V	118	245	287	117	279	182	290	333								
Cr	35.8	75.2	71.2	34.8	64.6	34.1	33.2	32.5	41.0	138	9.93	5.14	26.5	15.3	9.61	7.07
Co	26.2	36.8	44.7	37.6	41.1	22.8	31.2	35.0	26.9	37.4	13.7	14.0	22.9	21.3	16.4	17.3
Ni	23.4	61.1	68.0	21.1	38.6	22.6	25.5	26.0	14.8	44.9	4.38	4.10	10.8	8.30	6.90	6.40
Cu	4.55	4.09	34.5	2.13	28.4	11.7	28.0	33.9								
Zn	91.7	135	142	104	141	108	111	116								

Table S3: Continuted

Location	Baoxing intrusion															
Sample	SC01-4	SC01-5	SC01-6	SC01-7	SC09-1	SC09-2	SC09-3	SC10-1	CX411-1	CX412-1	CX484-1	CX484-3	CX485-1	CX485-2	CX486-1	CX486-2
Rock type	Sub alkaline mafic rock								Sub alkaline mafic rock							
Reference	Meng et al., 2015								Du et al., 2014							
Age(Ma)	799						802		856							
Ga	22.8	22.4	18.2	24.8	19.0	24.5	23.5	23.7	16.9	16.4	15.5	16.3	17.3	16.9	15.7	14.7
Ge																
Rb	46.2	45.4	31.8	57.2	34.5	46.1	25.5	20.3	11.5	7.66	24.8	43.1	15.3	21.7	6.52	8.88
Sr	822	579	585	781	584	720	628	579	482	518	618	596	570	620	897	572
Y	26.8	35.4	20.2	34.4	23.2	30.6	22.6	21.6	12.5	12.9	14.8	14.8	13.5	15.0	19.7	15.6
Zr	116	89.7	65.1	143	70.0	121	79.7	70.6	32.0	22.0	28.7	28.0	27.8	22.4	36.4	20.1
Nb	5.38	6.06	1.84	5.10	2.68	4.29	3.00	2.41	1.44	1.40	0.99	1.00	0.99	1.10	1.25	0.93
Sn	1.03	1.36	0.87	1.03	0.97	1.12	1.27	1.33								
Cs	1.49	1.81	0.34	1.28	0.63	1.12	0.88	0.73	0.85	0.36	1.32	1.45	1.12	3.07	0.24	0.38
Ba	705	427	280	726	309	588	354	266	365	156	391	430	453	515	243	448
La	22.6	21.5	9.94	29.6	12.3	24.4	15.6	12.4	2.74	2.45	3.19	3.20	3.23	2.43	3.23	2.78
Ce	60.7	56.7	22.3	66.9	29.2	54.9	33.7	27.0	6.31	6.20	7.66	6.75	7.35	6.03	8.42	6.83
Pr	7.38	8.04	3.02	8.56	4.02	7.05	4.31	3.54	0.93	1.01	1.15	0.98	0.97	0.94	1.32	1.10
Nd	29.5	35.2	13.3	36.8	17.7	30.7	19.1	16.5	5.36	5.75	5.64	5.09	4.99	4.93	6.99	5.80
Sm	5.92	7.50	3.34	7.58	4.17	6.56	4.53	4.18	1.42	1.80	1.53	1.49	1.55	1.60	2.07	1.65
Eu	1.75	2.12	1.26	2.07	1.43	1.91	1.58	1.54	0.80	0.71	0.51	0.50	0.61	0.51	0.69	0.52
Gd	5.12	6.58	3.61	6.61	4.20	5.94	4.51	4.36	1.88	2.18	1.89	1.88	2.17	2.10	2.34	1.93
Tb	0.77	0.98	0.55	0.99	0.64	0.89	0.68	0.66	0.34	0.38	0.31	0.31	0.35	0.33	0.39	0.33
Dy	4.35	5.59	3.43	5.67	3.86	5.11	3.90	3.79	2.30	2.30	2.25	2.16	2.26	2.31	2.81	2.31
Ho	0.89	1.16	0.71	1.12	0.80	1.01	0.78	0.75	0.53	0.54	0.48	0.46	0.51	0.50	0.61	0.49
Er	2.80	3.70	2.16	3.47	2.47	3.10	2.34	2.23	1.57	1.51	1.44	1.44	1.53	1.52	1.81	1.46
Tm	0.38	0.52	0.29	0.47	0.34	0.41	0.30	0.28	0.22	0.23	0.23	0.21	0.23	0.23	0.27	0.22
Yb	2.65	3.79	1.95	3.42	2.32	2.94	1.99	1.83	1.65	1.45	1.70	1.46	1.51	1.59	1.89	1.56
Lu	0.41	0.57	0.29	0.53	0.35	0.45	0.30	0.27	0.23	0.24	0.27	0.22	0.24	0.24	0.30	0.26
Hf	2.91	2.62	1.74	3.67	1.92	3.18	2.21	2.03	1.00	0.74	1.02	0.92	0.95	0.80	1.24	0.84
Ta	0.26	0.23	0.13	0.29	0.15	0.26	0.21	0.20	0.08	0.06	0.10	0.10	0.13	0.11	0.10	0.08

Table S3: Continuted

Location	Baoxing intrusion															
Sample	SC01-4	SC01-5	SC01-6	SC01-7	SC09-1	SC09-2	SC09-3	SC10-1	CX411-1	CX412-1	CX484-1	CX484-3	CX485-1	CX485-2	CX486-1	CX486-2
Rock type	Sub alkaline mafic rock								Sub alkaline mafic rock							
Reference	Meng et al., 2015								Du et al., 2014							
Age(Ma)	799						802						856			
Pb	5.34	3.03	3.26	4.26	3.21	5.17	6.90	7.29	2.13	1.70	3.42	3.78	2.72	2.17	3.95	2.86
Th	3.28	3.82	2.73	3.76	2.75	3.80	3.76	3.88	0.29	0.17	0.34	0.28	0.44	0.32	0.32	0.24
U	0.53	0.59	0.63	0.68	0.62	0.73	0.78	0.84	0.12	0.06	0.12	0.10	0.13	0.10	0.11	0.07
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)									0.703288	0.703237						
$\varepsilon_{Nd\ (t)}$									4.8	4.8						
Ratio																
Mg#	51.1	59.7	63.3	51.1	59.1	50.8	50.5	50.4	52.3	65.4	49.7	49.2	49.7	50.1	45.3	51.8
Sr/Y	30.7	16.4	29.0	22.7	25.1	23.6	27.7	26.8	38.5	40.2	41.8	40.4	42.2	41.4	45.6	36.7
Nb/La	0.24	0.28	0.19	0.17	0.22	0.18	0.19	0.19	0.53	0.57	0.31	0.31	0.31	0.45	0.39	0.33
Nb/U	10.2	10.3	2.92	7.50	4.32	5.88	3.85	2.87	12.0	23.3	8.25	10.0	7.62	11.0	11.4	13.3

Table S3: Continuted

Location	Guandaoshan intrusion										Ganyuhe intrusion				
Sample	CX486-3	CX486-4	GDS-1	GDS-2	GDS-3	GDS-4	GDS-5	GDS-6	GDS-7	GDS-8	GYH-1–1	GYH-1–2	GYH-1–3	GYH-1–5	GYH-1–6
Rock type			Sub alkaline mafic rock								Sub alkaline mafic rock				
Reference			Zhu et al., 2021								Zhu et al.,2021				
Age(Ma)		856	856.4±2.8								857.4±2.0				
Major(wt.%)															
SiO_2	51.94	50.42	52.19	53.20	52.36	53.21	52.50	53.27	52.00	52.35	45.98	46.04	45.81	45.91	45.53
TiO_2	0.71	0.45	0.41	0.41	0.46	0.43	0.43	0.42	0.48	0.48	1.34	1.35	1.37	1.37	1.36
Al_2O_3	15.36	18.24	18.65	19.11	18.52	19.06	18.29	19.14	18.87	19.17	14.49	14.56	14.91	15.02	14.82
Fe2O3T	12.22	8.30	7.84	7.83	8.45	8.20	8.31	7.56	8.30	8.32	12.99	13.04	13.22	13.07	13.24
Fe_2O_3															
FeO															
MnO	0.28	0.17	0.18	0.17	0.18	0.18	0.19	0.17	0.19	0.16	0.20	0.21	0.19	0.21	0.20
MgO	5.63	7.46	3.38	3.27	3.50	3.32	3.48	3.28	3.66	3.38	9.17	9.20	8.64	8.86	9.01
CaO	7.12	9.86	8.54	8.48	8.78	8.72	9.62	8.70	9.32	9.12	11.43	11.47	11.72	11.57	11.59
Na_2O	2.88	2.29	4.70	3.79	3.86	3.39	3.42	3.50	3.35	3.11	2.46	2.42	2.30	2.46	2.36
K_2O	1.37	0.84	1.42	1.54	1.35	1.50	1.04	1.26	1.25	1.38	0.37	0.37	0.40	0.39	0.41
P_2O_5	0.15	0.08	0.08	0.08	0.09	0.09	0.08	0.08	0.08	0.09	0.11	0.10	0.19	0.19	0.18
LOI	1.69	1.86	2.25	2.02	2.08	1.64	2.51	2.32	2.23	2.10	1.04	1.04	0.93	1.04	1.17
TOL	99.34	99.97	99.64	99.90	99.63	99.74	99.87	99.70	99.73	99.66	99.58	99.80	99.68	100.09	99.87
Trace(ppm)															
Li			7.38	5.90	7.25	11.5	9.51	9.38	8.48	7.83	4.31	4.55	4.35	4.68	4.77
Be			0.40	0.38	0.37	0.37	0.38	0.37	0.39	0.40	0.45	0.45	0.47	0.47	0.47
Sc	38.3	33.8	23.8	22.5	25.3	24.0	23.8	23.4	26.3	24.2	45.8	45.2	46.1	42.4	44.7
V			218	209	239	223	224	223	228	226	323	325	330	323	325
Cr	16.7	248	14.8	10.7	12.6	11.2	13.6	13.4	11.1	13.4	215	217	234	181	204
Co	25.6	36.5	43.1	57.4	46.2	57.0	51.3	51.0	46.0	72.5	83.5	82.9	83.8	80.9	81.3
Ni	9.17	62.1	8.06	6.77	7.79	7.26	7.36	7.36	7.21	6.63	80.9	80.8	88.7	86.1	87.8
Cu			24.1	20.8	21.5	20.4	22.7	22.5	27.5	20.6	41.0	41.3	50.5	54.7	80.7
Zn			60.4	57.2	63.0	58.2	60.6	60.1	62.5	60.4	74.7	74.8	72.9	77.4	79.7

Table S3: Continuted

Location	Guandaoshan intrusion										Ganyuhe intrusion				
Sample	CX486-3	CX486-4	GDS-1	GDS-2	GDS-3	GDS-4	GDS-5	GDS-6	GDS-7	GDS-8	GYH-1–1	GYH-1–2	GYH-1–3	GYH-1–5	GYH-1–6
Rock type			Sub alkaline mafic rock								Sub alkaline mafic rock				
Reference			Zhu et al., 2021								Zhu et al.,2021				
Age(Ma)		856	856.4±2.8								857.4±2.0				
Ga	14.0	15.7	14.7	14.4	14.6	14.4	14.2	14.2	14.9	14.9	17.3	17.3	18.1	17.5	18.0
Ge			1.26	1.24	1.33	1.28	1.35	1.33	1.31	1.39	1.59	1.57	1.77	1.64	1.65
Rb	24.0	22.6	21.5	24.0	20.3	23.1	16.4	16.1	19.3	20.1	3.36	3.15	4.18	3.44	4.04
Sr	341	481	532	493	529	507	585	581	557	540	192	192	239	252	253
Y	24.3	12.2	12.8	12.3	13.6	12.8	13.0	12.9	15.7	13.2	23.8	23.8	24.2	25.5	25.1
Zr	32.5	27.8	25.8	42.4	28.1	20.5	35.2	35.1	29.0	22.5	64.1	62.8	60.7	61.6	58.6
Nb	1.48	1.13	0.95	1.03	1.13	1.06	0.97	0.96	1.34	1.49	1.63	1.61	1.69	1.74	1.71
Sn															
Cs	0.74	1.07	0.51	0.54	0.51	0.55	0.43	0.43	0.48	0.50	0.10	0.10	0.18	0.11	0.16
Ba	479	434	644	682	661	654	484	480	584	644	84.5	84.1	81.3	118	82.6
La	4.01	3.66	3.10	2.99	3.21	3.11	3.04	3.03	3.52	3.81	3.65	3.63	4.77	5.10	4.95
Ce	10.9	8.69	6.98	6.98	7.52	7.22	6.79	6.78	8.75	9.04	10.5	10.4	13.2	14.3	13.9
Pr	1.69	1.21	1.00	0.99	1.09	1.04	0.98	0.99	1.26	1.28	1.73	1.74	2.08	2.28	2.23
Nd	8.84	5.44	5.00	5.00	5.50	5.21	4.98	4.99	6.21	6.28	9.46	9.40	10.7	11.9	11.7
Sm	2.72	1.55	1.49	1.45	1.59	1.52	1.50	1.50	1.76	1.66	3.05	3.06	3.19	3.56	3.57
Eu	0.75	0.53	0.62	0.61	0.65	0.63	0.60	0.60	0.72	0.68	1.13	1.12	1.18	1.23	1.26
Gd	3.29	1.98	1.71	1.66	1.87	1.76	1.74	1.73	2.06	1.89	3.71	3.71	3.79	4.15	4.14
Tb	0.54	0.30	0.30	0.29	0.33	0.31	0.31	0.31	0.37	0.33	0.65	0.65	0.66	0.71	0.71
Dy	3.88	2.09	2.07	2.02	2.23	2.11	2.14	2.13	2.49	2.20	4.12	4.15	4.18	4.51	4.43
Ho	0.83	0.44	0.45	0.43	0.48	0.45	0.46	0.46	0.54	0.49	0.87	0.87	0.88	0.94	0.93
Er	2.41	1.30	1.38	1.36	1.51	1.41	1.44	1.44	1.68	1.50	2.48	2.49	2.51	2.69	2.63
Tm	0.36	0.18	0.22	0.21	0.23	0.22	0.22	0.22	0.26	0.23	0.36	0.36	0.36	0.39	0.38
Yb	2.52	1.25	1.52	1.49	1.64	1.52	1.56	1.56	1.82	1.61	2.30	2.31	2.31	2.41	2.39
Lu	0.40	0.20	0.23	0.23	0.24	0.23	0.24	0.24	0.27	0.25	0.34	0.34	0.34	0.36	0.35
Hf	1.31	0.85	0.83	1.11	0.88	0.72	1.03	1.04	0.91	0.85	1.83	1.80	1.69	1.77	1.72
Ta	0.15	0.12	0.09	0.12	0.11	0.12	0.10	0.10	0.13	0.18	0.14	0.14	0.13	0.13	0.13

Table S3: Continuted

Location	Guandaoshan intrusion										Ganyuhe intrusion				
Sample	CX486-3	CX486-4	GDS-1	GDS-2	GDS-3	GDS-4	GDS-5	GDS-6	GDS-7	GDS-8	GYH-1–1	GYH-1–2	GYH-1–3	GYH-1–5	GYH-1–6
Rock type			Sub alkaline mafic rock								Sub alkaline mafic rock				
Reference			Zhu et al., 2021								Zhu et al.,2021				
Age(Ma)		856	856.4±2.8								857.4±2.0				
Pb	2.23	2.11	3.05	2.60	3.03	3.13	3.46	3.48	2.73	3.41	1.91	1.87	1.26	1.36	1.32
Th	0.52	0.41	0.39	0.43	0.49	0.39	0.44	0.44	0.41	0.50	0.25	0.28	0.16	0.18	0.19
U	0.16	0.13	0.12	0.14	0.15	0.13	0.14	0.14	0.14	0.17	0.06	0.07	0.04	0.05	0.05
Isotopic date															
$^{87}Sr/^{86}Sr$ (t)					0.703203	0.703895	0.703864							0.703535	0.703461
$\varepsilon_{Nd\ (t)}$					5.8	5.3	5.6							4.9	5
Ratio															
Mg#	51.8	67.7	50.1	49.3	49.1	48.5	49.4	50.3	50.7	48.6	62.2	62.2	60.4	61.2	61.3
Sr/Y	14.1	39.4	41.6	40.1	38.9	39.6	45.0	45.0	35.5	40.9	8.07	8.07	9.88	9.88	10.1
Nb/La	0.37	0.31	0.31	0.34	0.35	0.34	0.32	0.32	0.38	0.39	0.45	0.44	0.35	0.34	0.35
Nb/U	9.25	8.69	7.92	7.36	7.53	8.15	6.93	6.86	9.57	8.76	25.5	24.0	40.2	35.5	35.6

Table S3: Continuted

Location		Dajianshan intrusion							Gaojiacun intrusion						
Sample	GYH-1–7	DJS-1-1	DJS-1-2	DJS-1-3	DJS-1-4	DJS-1-5	DJS-1-6	DJS-1-7	GJZ9	GJZ24	GJZ7	GJZ26	GJZ31	GJZ45	GJZ34
Rock type		Sub alkaline mafic rock							Sub alkaline mafic rock						
Reference		Zhu et al., 2019							Zhu et al., 2006						
Age(Ma)		810.4±2.0							825						
Major(wt.%)															
SiO_2	45.61	52.62	53.25	52.72	53.87	53.55	52.66	52.74	40.68	43.82	41.02	43.48	48.76	42.81	42.33
TiO_2	1.39	0.53	0.54	0.51	0.53	0.56	0.53	0.54	0.43	0.18	0.01	0.80	0.49	0.89	0.15
Al_2O_3	14.85	20.15	20.19	20.10	20.14	19.98	20.63	20.21	23.24	12.90	26.78	15.45	16.31	19.74	1.15
Fe2O3T	13.09	7.49	7.45	7.45	7.18	7.26	7.46	7.45	4.97	7.70	4.32	6.10	8.03	8.69	12.76
Fe_2O_3									1.53	2.48	1.10	0.45	3.59	1.91	5.32
FeO									3.10	4.70	2.90	5.09	4.00	6.10	6.70
MnO	0.21	0.13	0.15	0.14	0.13	0.13	0.13	0.14	0.08	0.12	0.05	0.17	0.20	0.15	0.20
MgO	8.85	3.04	3.09	3.41	3.38	2.67	3.40	3.17	9.46	13.96	8.21	8.39	7.65	8.61	26.77
CaO	11.40	7.50	6.86	6.32	5.68	7.36	6.18	6.89	15.22	13.20	11.57	16.72	10.98	11.53	5.58
Na_2O	2.46	4.85	4.84	4.99	4.80	4.83	4.83	4.85	1.01	1.04	1.75	2.26	3.07	2.96	0.68
K_2O	0.39	0.84	1.04	1.21	1.47	0.92	1.34	1.06	0.07	0.08	0.14	0.13	1.56	0.60	0.06
P_2O_5	0.18	0.21	0.21	0.23	0.20	0.21	0.22	0.21	0.15	0.01	0.01	0.26	0.90	0.08	0.01
LOI	1.07	2.47	2.51	2.69	2.61	2.39	2.80	2.54	0.50	4.90	3.87	0.45	1.40	3.42	10.80
TOL	99.50	99.83	100.13	99.77	99.99	99.86	100.18	99.80	99.57	99.49	99.81	99.55	99.21	99.52	99.75
Trace(ppm)															
Li	4.90	1.63	4.36	5.69	5.55	4.84	6.52	5.51							
Be	0.49	1.38	1.54	1.69	1.99	1.34	1.75	1.71							
Sc	43.8	15.8	19.0	21.0	19.6	16.2	15.6	19.0							
V	326	124	128	125	123	133	115	123	65.0	115	6.16	83.8	181	406	117
Cr	186	22.7	24.4	23.2	26.4	23.1	20.7	24.7	521	1210	26.6	519	470	69.9	1510
Co	80.7	53.4	51.4	45.9	47.9	60.6	46.9	50.4							
Ni	85.5	11.1	9.78	9.58	8.86	11.1	11.1	9.69	115	228	109	148	221	40.3	821
Cu	54.3	18.4	12.8	13.6	14.0	34.4	21.6	17.3	16.2	60.6	20.7	12.7	110	61.1	171
Zn	78.5	74.9	77.9	83.1	84.3	67.5	81.6	81.0							

Table S3: Continuted

Location		Dajianshan intrusion							Gaojiacun intrusion						
Sample	GYH-1–7	DJS-1-1	DJS-1-2	DJS-1-3	DJS-1-4	DJS-1-5	DJS-1-6	DJS-1-7	GJZ9	GJZ24	GJZ7	GJZ26	GJZ31	GJZ45	GJZ34
Rock type		Sub alkaline mafic rock							Sub alkaline mafic rock						
Reference		Zhu et al., 2019							Zhu et al., 2006						
Age(Ma)		810.4±2.0							825						
Ga	17.7	21.0	21.6	21.4	21.4	22.0	20.6	21.6	12.7	8.04	11.9	12.6	20.9	16.9	3.61
Ge	1.64	1.53	1.50	1.41	1.38	1.51	1.29	1.41							
Rb	3.58	13.8	18.2	21.4	26.4	13.5	18.2	20.9	0.60	0.30	1.03	1.12	5.73	9.00	0.54
Sr	256	796	724	687	631	788	672	694	1010	426	968	118	643	842	41.0
Y	26.0	24.1	28.0	29.5	27.9	22.0	22.5	25.9	1.28	3.97	0.64	17.6	37.8	14.9	2.93
Zr	65.6	145	192	174	187	165	157	158	2.93	5.44	1.56	52.2	45.5	17.9	10.1
Nb	1.78	3.99	5.07	4.52	4.96	4.16	3.85	4.73	0.081	0.060	0.050	4.80	5.18	1.23	0.26
Sn															
Cs	0.12	0.10	0.11	0.14	0.17	0.11	0.15	0.14	0.064	0.041	0.089	0.092	2.64	0.58	0.048
Ba	139	445	511	592	698	448	677	614	45.2	22.6	56.6	31.4	659	272	17.9
La	5.18	18.6	9.90	15.3	25.2	24.2	11.8	21.8	0.61	0.64	0.41	15.2	34.5	1.65	1.14
Ce	14.8	42.1	25.3	35.0	54.5	51.2	29.0	47.9	1.39	1.76	0.79	30.1	86.0	6.16	3.00
Pr	2.33	5.38	3.59	4.79	6.70	6.10	3.91	5.98	0.23	0.31	0.096	3.66	11.2	1.20	0.48
Nd	12.2	22.8	17.1	21.8	27.5	24.3	17.7	24.9	1.11	1.86	0.45	15.7	48.5	7.25	2.48
Sm	3.65	4.81	4.41	5.24	5.64	4.59	4.14	5.16	0.28	0.63	0.077	3.57	11.3	2.48	0.64
Eu	1.26	1.35	1.30	1.45	1.50	1.35	1.28	1.43	0.26	0.31	0.19	0.85	2.58	1.14	0.29
Gd	4.29	4.54	4.47	5.19	5.31	4.27	4.02	4.88	0.35	0.67	0.055	3.50	9.69	2.85	0.79
Tb	0.73	0.68	0.72	0.81	0.80	0.62	0.62	0.73	0.044	0.11	0.01	0.55	1.47	0.47	0.11
Dy	4.58	4.16	4.46	5.01	4.88	3.73	3.78	4.48	0.33	0.61	0.035	2.82	7.52	2.80	0.63
Ho	0.96	0.85	0.93	1.03	0.99	0.77	0.79	0.92	0.052	0.11	0.01	0.63	1.46	0.56	0.12
Er	2.71	2.47	2.72	3.00	2.88	2.23	2.30	2.68	0.15	0.31	0.025	1.58	3.56	1.35	0.29
Tm	0.39	0.37	0.41	0.44	0.42	0.33	0.34	0.40	0.021	0.038	0.00	0.25	0.47	0.17	0.043
Yb	2.46	2.41	2.72	2.95	2.77	2.21	2.29	2.60	0.15	0.23	0.021	1.45	2.93	1.13	0.26
Lu	0.36	0.37	0.42	0.45	0.42	0.34	0.36	0.40	0.017	0.033	0.00	0.23	0.42	0.17	0.032
Hf	1.86	3.48	4.49	4.17	4.46	3.82	3.74	3.76	0.10	0.21	0.031	1.52	2.03	1.01	0.30
Ta	0.13	0.18	0.25	0.20	0.28	0.19	0.17	0.25	0.008	0.007	0.01	0.27	0.36	0.10	0.018

Table S3: Continuted

Location		Dajianshan intrusion							Gaojiacun intrusion						
Sample	**GYH-1–7**	**DJS-1-1**	**DJS-1-2**	**DJS-1-3**	**DJS-1-4**	**DJS-1-5**	**DJS-1-6**	**DJS-1-7**	**GJZ9**	**GJZ24**	**GJZ7**	**GJZ26**	**GJZ31**	**GJZ45**	**GJZ34**
Rock type		Sub alkaline mafic rock							Sub alkaline mafic rock						
Reference		Zhu et al., 2019							Zhu et al., 2006						
Age(Ma)		**810.4±2.0**							**825**						
Pb	1.36	14.5	13.6	12.4	10.6	14.6	11.7	12.4	21.0	1.16	1.57	4.20	11.1	1.20	0.59
Th	0.19	3.04	1.68	2.40	4.76	4.02	2.02	3.87	0.039	0.018	0.013	2.53	3.24	0.024	0.10
U	0.05	0.41	0.37	0.41	0.50	0.44	0.35	0.43	0.01	0.03	0.012	0.81	3.05	0.031	0.024
Isotopic date															
$^{87}Sr/^{86}Sr$ (t)		0.705392	0.705184							0.704900	0.704888				
$\varepsilon_{Nd\ (t)}$		1.5	1							1.3	1.6				
Ratio															
Mg#	61.2	48.6	49.2	51.6	52.3	46.2	51.5	49.8	81.6	80.9	81.6	76.2	68.9	69.8	83.0
Sr/Y	9.85	33.0	25.9	23.3	22.6	35.8	29.9	26.8	785	107	1500	6.70	17.0	56.5	14.0
Nb/La	0.34	0.21	0.51	0.30	0.20	0.17	0.33	0.22	0.13	0.094	0.12	0.32	0.15	0.75	0.22
Nb/U	34.9	9.73	13.7	11.0	9.92	9.45	11.0	11.0	5.79	1.88	4.17	5.95	1.70	39.7	10.7

Table S3: Continuted

Location															
Sample	**GJD1**	**GJD7**	**PZH46**	**PZH47**	**PZH48**	**PZH49**	**PZH50**	**PZH51**	**PZH52**	**PZH53**	**PZH54**	**PZH55**	**PZH56**	**PZH57**	**PZH58**
Rock type			**Sub alkaline mafic rock**												
Reference			**Zhou et al., 2006**												
Age(Ma)			**806.0±4.0**												
Major(wt.%)															
SiO_2	42.05	49.33	46.42	43.88	43.25	43.39	43.80	42.10	43.47	42.97	43.48	46.44	41.65	47.79	40.14
TiO_2	1.48	1.08	0.59	1.70	1.45	1.45	1.80	1.52	1.49	1.73	2.46	1.35	3.07	0.63	2.87
Al_2O_3	20.00	21.16	13.29	24.23	24.52	25.28	22.94	23.83	25.28	23.25	19.12	17.96	16.92	11.31	19.74
Fe2O3T	10.74	9.38	8.97	6.83	6.92	7.29	7.55	8.65	6.47	7.89	9.71	7.97	12.87	12.23	14.82
Fe_2O_3	3.46	3.94													
FeO	6.55	4.90													
MnO	0.21	0.28	0.14	0.09	0.09	0.08	0.09	0.09	0.07	0.08	0.12	0.13	0.14	0.20	0.13
MgO	8.17	3.90	15.55	6.07	5.56	4.92	7.19	4.92	5.24	6.46	8.94	9.95	10.04	17.67	6.52
CaO	11.42	9.03	14.42	14.75	15.28	15.33	14.56	14.65	15.44	14.67	13.98	15.79	12.30	8.15	13.07
Na_2O	2.94	4.13	0.76	1.89	1.74	1.79	1.87	1.67	1.74	1.80	1.99	1.31	2.09	1.15	1.15
K_2O	0.29	0.21	0.03	0.15	0.08	0.06	0.14	0.18	0.09	0.19	0.20	0.03	0.30	0.27	0.24
P_2O_5	0.15	0.42	0.04	0.05	0.06	0.05	0.04	0.05	0.03	0.03	0.05	0.03	0.05	0.11	0.98
LOI	2.10	1.03	1.08	1.09	0.95	0.94	0.93	1.00	0.90	0.89	0.82	0.53	0.99	1.57	0.49
TOL	99.45	99.41	101.28	100.72	99.91	100.58	100.92	98.74	100.23	99.97	100.85	100.85	100.42	101.09	101.03
Trace(ppm)															
Li															
Be															
Sc			41.6	43.9	34.8	30.7	43.0	29.4	30.6	35.8	58.9	50.1	61.0	26.6	40.9
V	519	245	139	249	260	280	320	339	253	309	398	269	488	168	521
Cr	135	48.3	573	128	96.0	101	70.0	92.0	93.0	223	81.0	141	60.0	791	18.0
Co			74.8	38.4	33.0	28.1	42.9	32.9	32.7	40.5	46.6	43.4	51.1	73.1	47.3
Ni	95.5	8.98	193	69.4	47.9	48.8	63.5	41.3	40.8	47.4	49.5	32.2	54.8	460	15.8
Cu	109	36.6	69.5	19.4	27.2	33.9	29.1	34.7	44.5	51.5	57.6	44.9	66.8	33.6	35.1
Zn			58.2	47.2	48.2	46.6	50.6	61.5	40.6	46.4	60.3	47.3	75.9	101	101

Table S3: Continuted

Location															
Sample	**GJD1**	**GJD7**	**PZH46**	**PZH47**	**PZH48**	**PZH49**	**PZH50**	**PZH51**	**PZH52**	**PZH53**	**PZH54**	**PZH55**	**PZH56**	**PZH57**	**PZH58**
Rock type			**Sub alkaline mafic rock**												
Reference			**Zhou et al., 2006**												
Age(Ma)			**806.0±4.0**												
Ga	19.0	23.2													
Ge															
Rb	1.24	1.04	1.11	2.06	0.70	0.84	1.21	1.51	0.96	1.84	1.12	0.58	1.64	2.99	2.64
Sr	717	909	561	1060	1070	1120	1040	1070	1110	1030	775	709	701	302	849
Y	17.2	21.0	6.26	7.80	7.42	6.70	9.36	7.39	8.36	8.94	15.4	10.2	17.3	11.2	18.4
Zr	26.3	46.5	20.5	17.1	14.4	13.7	20.7	15.9	14.5	15.9	26.8	15.0	31.7	65.8	36.5
Nb	1.94	9.19	0.60	0.99	0.93	0.87	1.21	1.04	0.99	1.03	1.56	0.64	1.98	2.18	2.31
Sn															
Cs	0.066	0.067	0.10	0.17	0.03	0.04	0.07	0.14	0.05	0.15	0.05	0.03	0.08	0.21	0.08
Ba	173	386	72.0	140	113	113	148	115	120	135	150	80.0	172	184	203
La	3.01	18.5	2.13	2.36	2.13	2.09	2.49	2.34	2.01	1.99	2.48	1.45	3.08	5.91	8.83
Ce	9.75	43.6	5.96	5.83	5.60	5.33	6.42	6.15	5.45	5.48	8.15	4.82	10.5	14.4	23.8
Pr	1.84	5.55	0.99	1.01	0.98	1.00	1.01	1.02	0.99	1.00	1.60	0.95	2.08	2.00	3.89
Nd	9.75	26.7	5.86	5.69	5.69	6.03	6.53	5.91	6.02	6.16	9.90	6.24	12.7	9.24	20.3
Sm	3.67	5.65	1.59	1.62	1.64	1.47	1.88	1.64	1.78	1.81	3.30	2.04	3.91	2.06	5.11
Eu	1.57	2.70	0.74	0.97	0.93	0.89	1.07	0.88	1.61	1.04	1.61	1.12	1.83	0.87	2.14
Gd	3.98	5.61	1.39	1.70	1.57	1.45	1.93	1.59	1.82	1.90	3.37	2.21	4.07	2.10	4.73
Tb	0.63	0.82	0.23	0.28	0.26	0.24	0.32	0.25	0.23	0.32	0.57	0.37	0.70	0.37	0.73
Dy	3.64	4.12	1.26	1.58	1.45	1.32	1.81	1.46	1.64	1.81	3.38	2.23	3.93	2.12	4.04
Ho	0.73	0.80	0.24	0.33	0.28	0.26	0.35	0.28	0.33	0.34	0.66	0.45	0.76	0.45	0.79
Er	1.64	1.91	0.61	0.79	0.76	0.68	0.92	0.74	0.82	0.88	1.74	1.12	1.99	1.30	2.04
Tm	0.21	0.29	0.08	0.09	0.11	0.09	0.12	0.11	0.10	0.12	0.19	0.13	0.24	0.18	0.24
Yb	1.33	1.68	0.52	0.57	0.54	0.52	0.69	0.57	0.62	0.65	1.26	0.84	1.45	1.22	1.40
Lu	0.18	0.25	0.07	0.08	0.07	0.08	0.17	0.08	0.08	0.09	0.17	0.12	0.21	0.21	0.21
Hf	1.09	3.13	0.62	0.52	0.46	0.42	0.59	0.48	0.49	0.52	0.96	0.60	1.21	1.82	1.17
Ta	0.087	0.45	0.04	0.05	0.04	0.05	0.06	0.05	0.05	0.05	0.09	0.04	0.11	0.13	0.13

Table S3: Continuted

Location															
Sample	**GJD1**	**GJD7**	**PZH46**	**PZH47**	**PZH48**	**PZH49**	**PZH50**	**PZH51**	**PZH52**	**PZH53**	**PZH54**	**PZH55**	**PZH56**	**PZH57**	**PZH58**
Rock type			**Sub alkaline mafic rock**												
Reference			**Zhou et al., 2006**												
Age(Ma)			**806.0±4.0**												
Pb	2.57	4.03	1.10	1.45	1.40	1.46	1.43	1.48	1.60	1.23	1.18	0.91	1.68	2.10	2.97
Th	0.087	0.22	0.07	0.07	0.03	0.03	0.05	0.07	0.03	0.04	0.04	0.03	0.06	0.38	0.14
U	0.032	0.098	0.02	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.02	0.01	0.02	0.10	0.06
Isotopic date															
$^{87}Sr/^{86}Sr$ (t)	0.704671	0.704582	0.704355	0.704775				0.704549	0.704698			0.704787			
$\varepsilon_{Nd\ (t)}$	1.8	2.2	3.6	2.0				2.10	3.10			2.50			
Ratio															
Mg#	63.9	49.2	80.2	67.4	65.2	61.1	68.9	57.0	65.4	65.6	68.2	74.4	64.5	77.1	50.6
Sr/Y	41.7	43.3	89.6	135	144	167	111	145	133	116	50.4	69.7	40.5	27.1	46.1
Nb/La	0.64	0.50	0.28	0.42	0.44	0.42	0.49	0.44	0.49	0.52	0.63	0.44	0.64	0.37	0.26
Nb/U	60.6	93.8	30.0	49.5	93.0	87.0	60.5	52.0	99.0	103	78.0	64.0	99.0	21.8	38.5

Table S3: Continuted

Location	Panzhihua intrusion															
Sample	**PZH60**	**PZH61**	**PZH62**	**PZH63**	**PZH26**	**PZH27**	**PZH30**	**PZH31**	**PZH32**	**PZH33**	**PZH34**	**PZH35**	**PZH37**	**PZH39**	**PZH43**	**PZH44**
Rock type					**Sub alkaline mafic rock**											
Reference					**Zhou et al., 2006**											
Age(Ma)					**812**											
Major(wt.%)																
SiO_2	45.60	46.60	46.60	46.87	43.90	45.46	42.11	48.07	45.07	42.62	44.28	49.41	47.71	50.00	46.27	47.81
TiO_2	0.35	0.18	0.39	1.46	0.40	0.60	0.41	0.63	0.55	0.34	3.03	0.65	1.06	1.09	2.10	1.29
Al_2O_3	19.56	26.13	25.23	17.41	3.08	5.71	3.09	4.87	5.14	3.23	16.86	16.49	13.27	17.68	18.29	13.77
Fe2O3T	6.50	4.37	4.08	13.38	13.02	11.36	13.30	9.88	12.48	12.89	12.10	7.37	10.29	9.60	10.38	11.43
Fe_2O_3																
FeO																
MnO	0.14	0.06	0.07	0.21	0.17	0.17	0.20	0.17	0.18	0.17	0.15	0.14	0.18	0.17	0.14	0.19
MgO	10.75	5.90	5.87	7.26	26.15	23.85	28.11	18.76	25.82	29.63	7.84	10.03	13.52	7.18	7.09	10.28
CaO	15.85	12.67	12.67	11.75	9.42	11.42	7.48	15.14	9.43	7.09	10.49	12.86	11.37	9.84	11.29	12.24
Na_2O	0.86	1.22	1.88	2.33	0.27	0.54	0.17	0.53	0.59	0.22	2.04	1.54	1.48	4.18	2.48	1.79
K_2O	0.01	0.02	1.19	0.21	0.13	0.23	0.07	0.20	0.27	0.05	1.03	0.95	1.02	0.57	0.75	0.65
P_2O_5	0.03	0.04	0.04	0.22	0.05	0.11	8.00	0.05	0.12	0.05	0.20	0.14	0.07	0.24	0.19	0.19
LOI	1.02	1.97	2.86	0.32	3.21	1.34	5.60	1.82	1.16	4.74	2.08	1.43	1.47	0.80	1.90	1.88
TOL	100.61	99.72	100.88	100.43	99.80	100.80	100.60	100.81	100.80	101.00	100.81	101.00	101.40	101.34	101.54	101.46
Trace(ppm)																
Li																
Be																
Sc	30.7	11.4	19.9	38.9	33.0	32.1	239	44.2	239	28.2	39.2	30.5	32.4	32.4	32.2	47.9
V	110	41.0	94.0	365	108	115	104	146	115	97.0	378	141	181	236	277	266
Cr	402	115	313	41.0	991	688	1120	1520	1610	1590	59.5	231	571	129	25.0	95.0
Co	51.2	38.5	26.0	40.4	145	78.6	117	68.2	119	121	51.4	42.0	58.6	33.3	46.2	51.4
Ni	80.4	105	56.1	32.5	1690		886		1400	884	60.3	168	482	30.3	180	255
Cu	39.2	93.9	28.4	37.6	624		279		185	185	31.6	32.9	65.1	33.2	38.1	19.7
Zn	39.7	234	25.6	129	84.1	73.3	118	47.3	75.8	75.8	107	67.8	94.9	89.1	90.7	94.3

Table S3: Continuted

Location	Panzhihua intrusion															
Sample	**PZH60**	**PZH61**	**PZH62**	**PZH63**	**PZH26**	**PZH27**	**PZH30**	**PZH31**	**PZH32**	**PZH33**	**PZH34**	**PZH35**	**PZH37**	**PZH39**	**PZH43**	**PZH44**
Rock type					Sub alkaline mafic rock											
Reference					Zhou et al., 2006											
Age(Ma)					812											
Ga																
Ge																
Rb	0.84	1.60	17.0	1.65	1.88	3.79	1.02	2.42	4.19	0.66	17.7	25.0	30.6	12.1	12.2	15.7
Sr	669	965	988	680	90.0	273	103	112	246	71.0	696	731	721	998	830	427
Y	3.06	1.66	3.06	20.2	7.51	9.77	7.16	11.0	9.28	5.76	24.3	10.5	12.5	21.9	20.1	20.9
Zr	8.60	6.70	10.5	67.0	27.1	50.4	33.9	34.8	47.3	20.0	79.4	77.8	58.3	139	84.5	79.3
Nb	0.23	0.20	0.35	3.87	0.64	0.91	0.68	1.10	1.11	0.44	4.77	1.76	3.51	4.78	4.16	3.69
Sn																
Cs	0.06	0.11	1.00	0.04	0.46	0.14	0.36	0.29	0.12	0.04	1.19	0.40	2.57	0.79	1.01	0.88
Ba	58.0	97.0	260	236	38.0	115	29.0	68.0	128	20.0	417	295	703	673	355	186
La	1.57	1.57	1.76	10.1	2.77	111	4.49	3.71	7.74	2.01	11.2	9.38	5.54	15.6	9.42	9.06
Ce	2.98	3.00	3.88	26.3	7.72	21.6	12.0	10.7	19.2	5.66	27.1	22.8	14.6	33.5	22.6	20.6
Pr	0.45	0.41	0.56	3.95	1.33	3.37	1.91	1.83	2.92	0.99	4.08	3.29	2.23	4.52	3.37	3.02
Nd	2.27	1.74	2.81	19.4	7.44	17.3	10.0	10.6	14.3	5.68	21.3	15.3	11.0	20.4	17.4	15.5
Sm	0.63	0.40	0.61	4.76	2.10	4.01	2.33	3.02	3.25	1.56	5.26	3.18	2.69	4.46	4.31	4.03
Eu	0.46	0.39	0.56	1.73	0.65	1.25	0.66	0.99	0.96	0.52	2.01	1.08	1.02	1.50	1.74	1.53
Gd	0.66	0.37	0.65	4.34	1.80	3.39	2.03	2.90	2.66	1.36	5.09	2.72	2.52	4.32	4.24	4.00
Tb	0.11	0.06	0.11	0.75	0.29	0.47	0.29	0.46	0.39	0.22	0.84	0.39	0.40	0.68	0.69	0.67
Dy	0.62	0.33	0.64	4.28	1.56	2.58	1.50	2.76	1.22	1.19	4.64	2.12	2.26	3.89	3.81	3.91
Ho	0.13	0.06	0.13	0.86	0.30	0.48	0.27	0.55	0.36	0.23	0.93	0.40	0.46	0.83	0.77	0.83
Er	0.33	0.17	0.34	2.33	0.75	1.19	0.73	1.35	0.93	0.61	2.49	1.09	1.26	2.29	2.13	2.20
Tm	0.04	0.02	0.04	0.29	0.11	0.14	0.11	0.19	0.13	0.08	0.33	0.16	0.18	0.33	0.29	0.31
Yb	0.27	0.15	0.28	1.90	0.64	0.82	0.55	1.12	0.74	0.49	2.01	0.93	1.08	2.17	1.72	1.96
Lu	0.04	0.02	0.04	0.28	0.10	0.13	0.08	0.16	0.11	0.07	0.30	0.13	0.17	0.33	0.25	0.28
Hf	0.27	0.20	0.33	2.19	0.88	1.59	0.89	1.40	1.22	0.63	2.13	1.85	1.45	3.36	2.15	2.17
Ta	0.02	0.02	0.02	0.18	0.04	0.06	0.04	0.05	0.06	0.03	0.26	0.10	0.18	0.27	0.22	0.22

Table S3: Continuted

Location	Panzhihua intrusion															
Sample	**PZH60**	**PZH61**	**PZH62**	**PZH63**	**PZH26**	**PZH27**	**PZH30**	**PZH31**	**PZH32**	**PZH33**	**PZH34**	**PZH35**	**PZH37**	**PZH39**	**PZH43**	**PZH44**
Rock type					**Sub alkaline mafic rock**											
Reference					**Zhou et al., 2006**											
Age(Ma)					**812**											
Pb	0.84	1.33	1.38	2.99	4.06	3.05	2.36	10.2	17.0	1.75	5.53	8.80	10.1	13.9	7.24	4.57
Th	0.07	0.08	0.07	0.17	0.31	0.63	1.00	0.47	0.77	0.15	0.74	1.01	0.44	2.36	0.85	0.71
U	0.02	0.02	0.02	0.05	0.09	0.16	0.16	0.12	0.17	0.05	0.24	0.28	0.21	0.68	0.26	0.55
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)	0.704733									0.704339	0.704556				0.704617	
$\varepsilon_{Nd\ (t)}$	1.60									4.70	4.00				3.50	
Ratio																
Mg#	79.4	75.9	77.0	55.8	82.4	83.0	83.1	81.6	82.8	84.3	60.2	76.0	75.4	63.5	61.4	67.7
Sr/Y	219	581	323	33.7	12.0	27.9	14.4	10.2	26.5	12.3	28.7	69.7	57.9	45.6	41.3	20.4
Nb/La	0.15	0.13	0.20	0.38	0.23	0.0082	0.15	0.30	0.14	0.22	0.43	0.19	0.63	0.31	0.44	0.41
Nb/U	11.5	10.0	17.5	77.4	7.11	5.69	4.25	9.17	6.53	8.80	19.9	6.29	16.7	7.03	16.0	6.71

Table S3: Continuted

Location	Lengshuiqing intrusion														
Sample	LSZ9	LSZ38	LSZ19	LSZ20	LSZ21	LSZ26	LSZ27	LSZ28	LSZ29	LSZ30	LSZ31	LSZ52	LSZ7	LSZ11	TD1
Rock type	Sub alkaline mafic rock														
Reference	Zhu et al., 2007														
Age(Ma)	821														825
Major(wt.%)															
SiO_2	46.23	45.94	41.40	40.65	40.45	48.36	48.76	47.65	46.46	46.19	47.27	50.28	44.52	38.82	51.10
TiO_2	0.91	1.68	0.38	0.34	0.59	1.23	1.15	0.64	1.42	1.81	0.81	0.78	1.12	0.53	1.32
Al_2O_3	6.31	9.89	7.13	7.11	7.73	9.89	16.05	17.29	16.04	15.75	14.86	6.83	12.88	4.45	18.80
Fe2O3T	10.57	11.65	16.42	15.78	14.47	10.69	9.67	7.62	11.53	12.44	7.99	10.63	11.84	13.53	8.64
Fe_2O_3															
FeO															
MnO	0.14	0.17	0.18	0.16	0.16	0.18	0.16	0.12	0.19	0.16	0.13	0.18	0.11	0.13	0.14
MgO	18.05	14.79	25.60	27.25	25.92	12.17	7.01	8.02	8.14	7.72	10.16	14.44	4.94	19.84	4.64
CaO	11.44	10.86	2.18	4.74	4.06	12.64	9.37	10.21	8.25	9.60	11.31	11.52	7.42	6.95	8.53
Na_2O	1.35	1.37	0.88	0.79	1.29	1.55	2.75	2.41	2.56	2.35	1.64	1.25	3.38	0.56	4.00
K_2O	0.23	0.76	0.97	0.16	0.26	0.44	0.63	1.35	0.84	0.73	1.07	0.29	1.07	0.30	0.22
P_2O_5	0.30	0.21	0.15	0.07	0.08	0.14	0.24	0.10	0.26	0.25	0.16	0.10	0.93	0.16	0.36
LOI	3.63	2.14	3.41	1.48	3.59	1.89	2.76	3.60	3.54	2.50	3.72	2.92	2.22	3.23	1.13
TOL	99.17	99.46	98.69	98.53	98.61	99.18	98.53	99.01	99.23	99.49	99.12	99.21			99.00
Trace(ppm)															
Li															
Be															
Sc	37.3	42.8	4.43	14.5	15.3	55.7	28.0	29.7	28.1	34.0	39.7	51.2	17.2	25.3	18.7
V	154	222	64.8	86.7	111	276	221	160	237	355	162	194	143	104	179
Cr	1220	1190	1880	2340	2080	1130	90.4	55.8	37.7	57.3	263	694	151	604	87.0
Co	87.0	70.2	130	152	130	59.6	39.7	31.1	47.5	56.1	43.9	81.2	256	207	25.5
Ni	694	486	855	1300	946	243	77.3	54.0	50.0	64.5	126	748	3320	2330	19.2
Cu	276	64.4	37.7	37.7	120	45.5	51.1	8.83	31.4	41.2	26.8	619	1430	1080	
Zn	61.6	86.9	96.1	136	94.9	84.1	79.2	59.6	104	104	70.5	79.3	72.4	94.0	

Table S3: Continuted

Location	Lengshuiqing intrusion														
Sample	LSZ9	LSZ38	LSZ19	LSZ20	LSZ21	LSZ26	LSZ27	LSZ28	LSZ29	LSZ30	LSZ31	LSZ52	LSZ7	LSZ11	TD1
Rock type	Sub alkaline mafic rock														
Reference	Zhu et al., 2007														
Age(Ma)	821														825
Ga	8.93	13.6	10.2	7.38	8.34	14.5	18.3	15.5	19.5	20.3	14.0	9.71	14.0	6.34	
Ge															
Rb	2.33	14.4	20.7	2.88	3.33	7.01	11.9	26.0	17.4	13.5	30.1	5.57	22.7	6.16	2.04
Sr	231	361	223	260	282	325	550	700	580	622	504	175	1090	199	1080
Y	15.9	21.7	7.79	5.07	6.97	21.0	18.4	10.3	19.1	18.0	15.8	17.1	22.2	10.5	7.03
Zr	103	108	78.7	28.9	37.4	92.1	95.3	47.2	109	139	62.5	69.2	150	64.9	37.2
Nb	2.99	3.76	2.68	0.91	1.22	2.43	3.88	1.52	4.13	3.32	2.29	1.20	5.29	1.56	4.00
Sn															
Cs	0.11	0.81	1.13	0.057	0.078	0.42	0.79	0.87	0.85	0.82	1.33	0.26	0.92	0.57	0.20
Ba	85.7	289	467	99.0	133	153	217	567	271	338	326	79.1	956	131	354
La	14.5	11.1	7.50	2.76	3.41	7.38	10.2	5.62	11.1	11.9	5.89	6.77	37.8	8.77	11.5
Ce	40.4	31.1	16.0	6.55	8.30	17.5	23.5	12.5	26.4	25.5	14.7	19.3	80.9	22.2	25.4
Pr	6.38	5.00	2.12	0.93	1.19	2.62	3.16	1.76	3.73	3.46	2.26	3.37	10.9	3.39	3.31
Nd	28.7	25.0	9.21	4.28	5.56	12.5	13.9	7.95	16.7	14.6	10.8	16.3	44.2	15.3	15.0
Sm	6.41	6.22	1.86	1.02	1.41	3.62	3.25	1.98	3.90	3.73	2.98	4.50	8.48	3.75	2.82
Eu	1.76	2.15	0.67	0.46	0.59	1.36	1.20	1.02	1.45	1.46	1.15	1.38	2.33	1.12	1.51
Gd	4.95	5.19	1.65	0.96	1.35	3.40	2.94	1.81	3.48	3.29	2.67	3.64	6.46	2.82	2.27
Tb	0.70	0.79	0.25	0.16	0.21	0.59	0.49	0.29	0.56	0.54	0.46	0.58	0.80	0.43	0.30
Dy	3.72	4.73	1.42	0.98	1.39	3.86	3.13	1.82	3.44	3.23	2.82	3.32	4.23	2.18	1.47
Ho	0.70	0.92	0.31	0.20	0.28	0.79	0.63	0.38	0.70	0.65	0.58	0.65	0.76	0.42	0.25
Er	1.67	2.33	0.85	0.53	0.72	1.96	1.70	0.98	1.79	1.73	1.47	1.58	1.98	1.01	0.69
Tm	0.24	0.32	0.12	0.081	0.10	0.28	0.25	0.14	0.25	0.24	0.21	0.23	0.24	0.14	0.09
Yb	1.27	1.91	0.80	0.49	0.62	1.75	1.61	0.87	1.64	1.56	1.30	1.45	1.49	0.83	0.49
Lu	0.20	0.28	0.13	0.075	0.094	0.27	0.24	0.13	0.25	0.23	0.19	0.22	0.21	0.11	0.08
Hf	2.97	3.67	2.08	0.79	0.98	2.58	2.51	1.27	2.75	3.19	1.69	2.01	3.82	1.80	0.94
Ta	0.27	0.28	0.18	0.085	0.10	0.18	0.24	0.10	0.25	0.20	0.15	0.078	0.37	0.10	0.19

Table S3: Continuted

Location	Lengshuiqing intrusion														
Sample	**LSZ9**	**LSZ38**	**LSZ19**	**LSZ20**	**LSZ21**	**LSZ26**	**LSZ27**	**LSZ28**	**LSZ29**	**LSZ30**	**LSZ31**	**LSZ52**	**LSZ7**	**LSZ11**	**TD1**
Rock type	**Sub alkaline mafic rock**														
Reference	**Zhu et al., 2007**														
Age(Ma)	**821**														**825**
Pb	5.98	9.37	4.89	15.4	1.34	20.5	15.3	5.38	8.06	5.94	5.29	10.6	17.0	6.99	3.59
Th	0.94	1.28	0.89	0.26	0.31	0.74	1.10	0.46	0.92	1.10	0.49	0.72	3.76	0.73	0.13
U	0.24	0.35	0.25	0.07	0.094	0.20	0.33	0.11	0.22	0.31	0.22	0.27	1.07	0.22	0.02
Isotopic date															
$^{87}Sr/^{86}Sr$ (t)				0.704430						0.704370				0.704220	0.705196
$\varepsilon_{Nd\ (t)}$				4.30						2.20				4.90	0.93
Ratio															
Mg#	79.9	74.7	78.4	80.1	80.7	72.6	62.8	71.0	62.2	59.1	74.8	76.0	49.3	77.4	55.6
Sr/Y	14.5	16.6	28.6	51.3	40.5	15.5	29.9	68.0	30.4	34.6	31.9	10.2	49.3	19.0	154
Nb/La	0.21	0.34	0.36	0.33	0.36	0.33	0.38	0.27	0.37	0.28	0.39	0.18	0.14	0.18	0.35
Nb/U	12.7	10.7	10.6	13.0	13.0	12.0	11.8	14.3	18.8	10.7	10.4	4.41	4.94	7.12	200

Table S3: Continuted

Location																
Sample	**TD2**	**TD3**	**TD4**	**TD5**	**TD6**	**TD8**	**TD9**	**TD10**	**TD11**	**TD12**	**TD13**	**TD14**	**TD15**	**TD16**	**TD17**	**TD18**
Rock type																
Reference																
Age(Ma)																
Major(wt.%)																
SiO_2	51.80	51.00	51.40	51.40	51.10	51.90	50.80	52.80	52.00	51.90	51.20	51.20	51.50	50.70	48.00	49.30
TiO_2	1.28	1.34	1.31	1.34	1.36	1.48	1.34	1.24	1.33	1.21	1.30	1.37	1.27	1.31	1.46	1.50
Al_2O_3	19.50	19.20	19.40	19.10	19.30	19.60	20.00	19.70	19.40	19.80	19.30	19.10	19.40	19.70	17.90	18.80
Fe2O3T	8.03	8.58	8.38	8.44	8.43	8.20	8.22	8.05	8.18	7.37	8.20	8.44	8.36	8.48	10.49	9.82
Fe_2O_3																
FeO																
MnO	0.13	0.13	0.13	0.14	0.13	0.12	0.11	0.13	0.13	0.12	0.13	0.13	0.13	0.13	0.20	0.15
MgO	4.19	4.38	4.46	4.45	4.32	4.13	4.48	4.37	4.20	3.97	4.32	4.37	4.27	4.12	5.21	5.01
CaO	8.43	8.69	8.72	8.95	8.72	8.69	8.95	8.37	8.49	8.01	8.37	8.44	8.65	9.02	11.84	9.04
Na_2O	4.25	4.02	4.12	4.05	4.22	4.36	4.52	4.67	4.29	4.59	4.19	4.33	4.19	4.25	3.08	3.92
K_2O	0.33	0.21	0.24	0.26	0.24	0.18	0.36	0.25	0.28	0.27	0.30	0.24	0.33	0.23	0.21	0.13
P_2O_5	0.34	0.35	0.37	0.36	0.36	0.40	0.40	0.34	0.35	0.32	0.36	0.35	0.35	0.36	0.37	0.30
LOI	0.70	0.78	0.63	0.56	0.61	0.43	0.77	0.84	0.56	1.56	1.37	0.63	0.40	0.56	0.60	0.69
TOL	99.00	98.70	99.10	99.10	98.80	99.50	99.90	100.80	99.20	99.10	99.10	98.60	98.80	98.90	99.50	98.70
Trace(ppm)																
Li																
Be																
Sc	16.0	16.9	16.0	17.0	16.9	15.2	22.1	15.5	15.8	15.3	17.8	16.2	16.3	18.3	29.1	18.4
V	161	191	170	161	163	156	177	150	157	148	167	168	176	171	248	201
Cr	67.4	38.1	64.9	89.2	76.9	55.8	62.4	63.3	63.2	58.5	69.4	67.7	75.7	53.5	41.7	84.8
Co	22.4	24.1	22.8	22.3	21.8	21.2	23.1	21.0	22.2	20.3	22.7	23.4	23.0	23.4	28.4	27.3
Ni	16.2	17.0	16.0	16.0	16.2	15.8	17.6	15.3	15.3	14.8	18.6	16.2	19.1	20.6	17.7	27.2
Cu																
Zn																

Table S3: Continuted

Location																
Sample	**TD2**	**TD3**	**TD4**	**TD5**	**TD6**	**TD8**	**TD9**	**TD10**	**TD11**	**TD12**	**TD13**	**TD14**	**TD15**	**TD16**	**TD17**	**TD18**
Rock type																
Reference																
Age(Ma)																
Ga																
Ge																
Rb	1.71	1.20	0.90	0.86	0.42	0.38	1.50	1.16	0.83	2.12	2.38	0.74	1.00	0.52	1.11	0.33
Sr	1100	1080	1100	1090	1110	1120	1110	1080	1120	1170	1110	1120	1160	1140	837	859
Y	6.73	6.92	6.90	6.83	7.72	6.85	16.1	6.90	7.14	6.74	6.89	6.53	7.26	8.34	15.1	8.92
Zr	51.9	27.7	43.0	37.8	57.1	40.4	42.6	57.9	62.0	63.3	38.6	68.4	59.9	78.1	53.6	50.8
Nb	4.29	4.17	4.02	4.03	4.39	4.59	4.78	4.80	4.01	4.06	3.91	4.07	4.06	4.26	2.64	4.63
Sn																
Cs	0.14	0.19	0.09	0.06	0.03	0.06	0.10	0.24	0.14	0.33	0.17	0.08	0.07	0.05	0.04	0.03
Ba	463	382	429	434	431	460	460	437	494	372	339	395	454	421	268	275
La	12.5	12.0	12.3	11.4	12.4	13.1	15.3	12.4	13.0	12.5	12.2	12.1	12.3	13.5	10.8	11.2
Ce	26.8	26.4	26.8	24.7	27.8	29.1	39.8	27.0	28.0	27.3	26.9	26.1	27.8	30.0	25.2	25.4
Pr	3.51	3.51	3.58	3.35	3.77	3.81	5.90	3.65	3.73	3.57	3.51	3.44	3.71	4.02	3.58	3.50
Nd	15.3	15.6	16.2	15.2	17.2	17.2	28.5	16.0	16.5	15.8	15.6	15.1	16.2	17.8	16.7	15.9
Sm	2.92	3.06	3.17	3.07	3.38	3.36	6.46	3.19	3.21	2.96	2.96	2.80	3.10	3.58	3.80	3.50
Eu	1.62	1.61	1.61	1.57	1.69	1.65	2.25	1.55	1.61	1.67	1.58	1.55	1.60	1.77	1.67	1.77
Gd	2.31	2.53	2.48	2.51	2.76	2.60	5.29	2.48	2.59	2.42	2.28	2.31	2.39	2.77	3.86	2.96
Tb	0.30	0.32	0.32	0.32	0.37	0.33	0.73	0.32	0.33	0.31	0.30	0.29	0.31	0.36	0.55	0.39
Dy	1.40	1.52	1.59	1.55	1.76	1.59	3.74	1.57	1.59	1.49	1.45	1.40	1.52	1.74	3.05	2.00
Ho	0.25	0.27	0.29	0.28	0.31	0.28	0.66	0.27	0.28	0.26	0.26	0.24	0.26	0.31	0.61	0.36
Er	0.69	0.73	0.75	0.73	0.82	0.73	1.76	0.74	0.78	0.72	0.72	0.69	0.72	0.85	1.74	1.01
Tm	0.08	0.09	0.09	0.09	0.10	0.09	0.22	0.09	0.10	0.08	0.09	0.08	0.09	0.10	0.23	0.13
Yb	0.50	0.56	0.55	0.54	0.65	0.57	1.31	0.57	0.65	0.52	0.54	0.47	0.61	0.61	1.41	0.81
Lu	0.07	0.08	0.08	0.09	0.09	0.08	0.19	0.09	0.09	0.08	0.07	0.07	0.08	0.09	0.23	0.12
Hf	1.43	0.82	1.12	1.04	1.51	1.10	1.44	1.51	1.50	1.50	0.98	1.49	1.43	1.60	1.63	1.35
Ta	0.33	0.21	0.23	0.20	0.21	0.24	0.23	0.68	0.21	0.39	0.19	0.20	0.20	0.21	0.18	0.25

Table S3: Continuted

Location																
Sample	**TD2**	**TD3**	**TD4**	**TD5**	**TD6**	**TD8**	**TD9**	**TD10**	**TD11**	**TD12**	**TD13**	**TD14**	**TD15**	**TD16**	**TD17**	**TD18**
Rock type																
Reference																
Age(Ma)																
Pb	4.36	4.40	4.06	6.04	4.12	9.60	4.68	4.71	4.79	4.43	3.82	3.68	4.01	4.02	6.35	3.63
Th	0.18	0.13	0.12	0.12	0.09	0.07	0.14	0.14	0.13	0.10	0.10	0.080	0.11	0.10	0.70	0.10
U	0.04	0.03	0.03	0.03	0.02	0.02	0.04	0.05	0.04	0.03	0.02	0.01	0.03	0.03	0.19	0.06
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)								0.705245						0.705063		
$\varepsilon_{Nd\ (t)}$								1.22						0.90		
Ratio																
Mg#	54.9	54.3	55.4	55.1	54.4	54.0	56.0	55.9	54.5	55.7	55.1	54.7	54.3	53.1	53.6	54.3
Sr/Y	164	156	159	160	143	163	69.0	157	157	173	161	171	160	136	55.6	96.3
Nb/La	0.34	0.35	0.33	0.35	0.35	0.35	0.31	0.39	0.31	0.32	0.32	0.34	0.33	0.32	0.24	0.41
Nb/U	107	139	134	134	220	230	120	96.0	100	135	196	407	135	142	13.9	77.2

Table S3: Continuted

Location																
Sample	**TD19**	**TD20**	**TD21**	**TD23**	**TD24**	**TD25**	**TD26**	**TD27**	**TD28**	**TD30**	**TD31**	**TD32**	**TD33**	**TD34**	**TD35**	**TD36**
Rock type	**Sub alkaline mafic rock**															
Reference	**Sun, 2009**															
Age(Ma)																
Major(wt.%)																
SiO_2	51.00	51.80	56.40	54.70	52.00	52.60	52.80	52.90	48.70	58.30	54.00	54.90	47.80	56.50	46.60	46.10
TiO_2	1.28	1.25	1.12	0.58	0.77	1.50	1.24	0.60	1.29	0.40	1.36	1.35	1.83	0.76	1.76	1.22
Al_2O_3	19.90	19.90	16.80	17.00	16.40	19.70	19.50	17.70	18.60	16.90	20.30	20.60	18.10	18.50	17.20	18.80
Fe2O3T	8.21	8.10	8.03	6.84	7.02	9.15	8.09	6.72	9.11	5.78	9.36	9.48	11.28	6.35	12.87	11.77
Fe_2O_3																
FeO																
MnO	0.13	0.12	0.13	0.12	0.11	0.16	0.14	0.14	0.13	0.12	0.16	0.15	0.14	0.13	0.19	0.17
MgO	4.12	3.87	4.24	5.45	6.57	2.74	3.26	5.58	5.43	4.92	5.87	6.41	6.30	3.42	6.57	7.00
CaO	8.62	8.40	6.71	10.13	10.59	7.76	8.04	9.78	9.73	8.61	9.17	10.08	9.42	7.21	9.19	10.60
Na_2O	4.55	4.47	3.55	2.97	2.62	4.44	4.34	3.08	3.39	3.19	3.58	3.52	3.12	4.33	2.61	2.41
K_2O	0.30	0.38	1.57	0.29	0.47	0.24	0.46	0.86	0.83	0.29	0.24	0.23	0.39	0.43	0.46	0.29
P_2O_5	0.35	0.35	0.31	0.10	0.16	0.48	0.29	0.16	0.20	0.09	0.36	0.41	0.20	0.19	0.51	0.58
LOI	1.26	0.43	1.08	0.96	2.76	0.40	0.99	1.33	1.72	1.18	1.27	1.10	1.22	0.87	1.82	1.10
TOL	99.80	99.10	100.00	99.20	99.50	99.20	99.10	98.90	99.10	99.90	105.60	108.20	99.70	98.70	99.80	100.00
Trace(ppm)																
Li																
Be																
Sc	16.4	14.3	14.5	25.1	25.6	15.8	17.5	26.3	26.4	22.3	18.8	22.0	25.4	14.9	26.8	19.6
V	155	143	126	167	157	75.0	178	118	247	99.0	189	181	274	104	278	235
Cr	50.5	82.7	97.0	136	269	3.80	11.6	53.5	101	235	78.1	131	27.0	55.7	82.6	65.1
Co	20.3	19.2	21.7	25.5	29.5	11.9	20.6	26.1	30.8	19.5	24.9	26.0	33.6	15.8	45.5	34.2
Ni	13.0	28.3	28.0	39.0	59.4	2.10	5.70	20.4	27.8	46.9	21.0	30.0	16.8	15.8	21.1	23.9
Cu																
Zn																

Table S3: Continuted

Location																
Sample	**TD19**	**TD20**	**TD21**	**TD23**	**TD24**	**TD25**	**TD26**	**TD27**	**TD28**	**TD30**	**TD31**	**TD32**	**TD33**	**TD34**	**TD35**	**TD36**
Rock type	**Sub alkaline mafic rock**															
Reference	**Sun, 2009**															
Age(Ma)																
Ga																
Ge																
Rb	1.27	1.50	17.9	1.27	3.09	0.99	2.76	9.24	7.93	2.32	1.35	1.56	1.74	2.71	5.18	2.90
Sr	1120	1150	755	643	653	961	866	591	864	742	963	903	788	847	789	811
Y	11.7	10.4	9.39	9.31	8.57	10.2	9.46	10.5	10.1	13.0	10.2	12.5	14.5	8.99	13.7	13.2
Zr	84.4	87.6	58.3	30.6	44.0	176	220	94.0	58.1	57.0	80.8	69.2	139	154	34.5	51.4
Nb	4.34	4.44	5.19	1.97	2.10	6.11	4.84	2.97	3.97	1.91	4.05	4.49	5.57	3.55	3.00	2.78
Sn																
Cs	0.13	0.10	1.33	0.06	0.09	0.09	0.20	0.29	0.13	0.08	0.11	0.09	0.11	0.18	0.25	0.20
Ba	366	495	1010	269	385	567	566	359	421	603	369	403	475	693	282	315
La	14.4	14.8	16.1	8.20	10.7	11.6	15.2	11.1	12.0	9.90	13.4	13.6	13.0	13.6	10.2	14.0
Ce	35.4	35.0	36.0	21.2	24.8	24.9	31.5	22.2	29.2	24.8	29.4	32.9	33.9	28.2	26.7	34.0
Pr	4.99	4.84	4.62	3.08	3.27	3.44	3.96	2.75	3.80	3.64	3.97	4.59	4.90	3.54	4.16	4.61
Nd	23.2	22.1	19.4	13.5	13.9	15.9	16.0	11.7	16.1	16.9	17.3	21.2	22.5	15.0	20.2	21.1
Sm	4.81	4.48	3.69	2.84	2.87	3.48	2.94	2.53	3.24	3.66	3.70	4.52	4.99	2.90	4.74	4.40
Eu	1.85	1.72	1.32	0.97	1.04	2.00	1.62	1.06	1.45	1.63	1.53	1.70	1.91	1.33	1.87	1.64
Gd	3.90	3.48	2.99	2.41	2.44	3.11	2.41	2.35	2.84	3.38	3.10	3.77	4.25	2.49	4.27	3.83
Tb	0.52	0.47	0.41	0.34	0.34	0.42	0.34	0.34	0.38	0.48	0.42	0.53	0.60	0.34	0.57	0.52
Dy	2.62	2.32	2.01	1.83	1.79	2.13	1.80	2.01	2.02	2.57	2.16	2.69	3.19	1.82	3.08	2.75
Ho	0.46	0.41	0.36	0.35	0.32	0.38	0.34	0.37	0.36	0.48	0.39	0.48	0.57	0.35	0.55	0.53
Er	1.29	1.11	1.04	1.00	0.90	1.10	1.01	1.12	1.04	1.37	1.09	1.38	1.61	1.00	1.51	1.43
Tm	0.16	0.15	0.15	0.13	0.12	0.13	0.14	0.15	0.14	0.19	0.15	0.18	0.21	0.14	0.19	0.18
Yb	1.03	0.87	0.90	0.90	0.77	0.86	0.93	1.06	0.86	1.21	0.87	1.14	1.35	0.91	1.16	1.19
Lu	0.14	0.13	0.13	0.14	0.12	0.12	0.15	0.17	0.13	0.17	0.13	0.16	0.20	0.15	0.17	0.17
Hf	2.29	2.32	1.85	1.17	1.45	3.36	4.24	2.36	1.58	1.53	2.18	1.98	3.52	3.83	1.34	1.80
Ta	0.21	0.23	0.36	0.11	0.13	0.23	0.25	0.22	0.21	0.10	0.23	0.22	0.30	0.21	0.20	0.17

Table S3: Continuted

Location																
Sample	**TD19**	**TD20**	**TD21**	**TD23**	**TD24**	**TD25**	**TD26**	**TD27**	**TD28**	**TD30**	**TD31**	**TD32**	**TD33**	**TD34**	**TD35**	**TD36**
Rock type	**Sub alkaline mafic rock**															
Reference	**Sun, 2009**															
Age(Ma)																
Pb	5.81	5.58	8.41	4.37	3.86	4.29	5.17	7.60	5.49	4.52	4.43	4.59	4.47	19.8	2.66	3.81
Th	0.16	0.24	2.38	0.15	0.48	0.17	0.34	1.85	0.18	0.17	0.26	0.25	0.23	0.62	0.43	0.50
U	0.08	0.10	0.57	0.07	0.14	0.13	0.19	0.37	0.10	0.12	0.16	0.15	0.12	0.36	0.17	0.24
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)					0.702822								0.705165			0.705053
$\varepsilon_{Nd\ (t)}$					1.23								0.95			1.19
Ratio																
Mg#	53.9	52.7	55.2	65.0	68.6	41.1	48.4	65.9	58.1	66.5	59.4	61.2	56.6	55.7	54.3	58.1
Sr/Y	96.5	110	80.4	69.1	76.2	94.7	91.5	56.3	85.5	57.2	94.4	72.2	54.4	94.2	57.8	61.4
Nb/La	0.30	0.30	0.32	0.24	0.20	0.53	0.32	0.27	0.33	0.19	0.30	0.33	0.43	0.26	0.29	0.20
Nb/U	54.3	44.4	9.11	28.1	15.0	47.0	25.5	8.03	39.7	15.9	25.3	29.9	46.4	9.86	17.6	11.6

Table S3: Continuted

Location	˙ongde intrusion															
Sample	**TD38**	**TD39**	**TD40**	**TD41**	**TD42**	**TD43**	**TD43-**	**TD44**	**TD45**	**TD46**	**TD47**	**TD48**	**TD49**	**TD50**	**Gj524**	**Gj1680**
Rock type																
Reference																
Age(Ma)																
Major(wt.%)																
SiO_2	47.30	49.30	50.00	54.40	49.10	50.60	57.00	53.70	56.90	57.80	58.20	53.00	53.70	53.30	56.58	58.47
TiO_2	1.84	1.54	1.31	1.53	1.29	1.26	0.99	1.41	0.91	0.90	0.89	1.13	1.13	1.23	1.01	0.95
Al_2O_3	16.70	19.80	20.30	21.00	19.20	18.40	17.70	16.00	17.30	17.90	18.10	18.40	18.80	18.20	16.62	17.05
Fe2O3T	13.40	9.18	9.02	10.12	9.72	9.16	7.09	9.67	6.28	6.08	5.64	7.91	7.75	8.40	7.19	6.97
Fe_2O_3																
FeO																
MnO	0.22	0.16	0.16	0.16	0.15	0.16	0.12	0.17	0.11	0.10	0.10	0.13	0.14	0.15	0.13	0.18
MgO	6.80	4.71	4.89	5.32	5.44	5.53	3.29	4.62	2.99	2.80	2.96	4.18	4.05	4.83	3.72	3.43
CaO	8.86	8.52	8.29	9.90	9.65	6.49	6.56	6.33	5.87	6.53	6.18	7.30	6.12	6.59	6.29	5.42
Na_2O	2.57	4.03	4.15	3.79	3.68	4.38	4.05	3.50	4.13	4.10	4.44	4.16	4.76	3.86	3.77	4.09
K_2O	0.15	0.42	0.31	0.29	0.37	0.84	1.17	0.99	1.45	1.28	1.25	0.77	0.96	1.02	1.60	1.07
P_2O_5	0.57	0.48	0.37	0.42	0.29	0.33	0.28	0.39	0.25	0.23	0.23	0.29	0.30	0.36	0.28	0.28
LOI	1.60	1.54	0.95	1.09	0.94	2.67	1.44	2.43	2.62	1.86	1.91	1.73	1.98	2.05	1.50	1.47
TOL	100.00	99.70	99.80	108.00	99.90	99.90	99.60	99.20	98.90	99.60	99.90	99.10	99.70	100.00	98.69	99.38
Trace(ppm)																
Li																
Be																
Sc	18.9	19.0	20.3	30.7	23.0	20.8	16.1	18.1	14.9	13.1	10.9	15.7	14.7	17.3	16.5	10.8
V	253	176	185	253	200	170	131	175	101	95.0	99.0	138	119	151	142	117
Cr	88.0	78.0	60.7	77.0	50.7	72.1	50.2	73.1	35.0	38.8	45.5	67.4	47.8	72.0	83.1	60.0
Co	32.3	24.1	25.6	28.9	26.8	26.6	19.6	22.9	15.0	14.6	14.5	19.8	18.2	22.2	20.3	19.2
Ni	18.8	17.6	15.6	15.3	15.4	16.5	21.5	19.6	10.8	12.5	23.2	15.1	13.0	26.1	24.8	24.7
Cu																
Zn																

Table S3: Continuted

Location	˙ongde intrusion															
Sample	**TD38**	**TD39**	**TD40**	**TD41**	**TD42**	**TD43**	**TD43-**	**TD44**	**TD45**	**TD46**	**TD47**	**TD48**	**TD49**	**TD50**	**Gj524**	**Gj1680**
Rock type																
Reference																
Age(Ma)																
Ga																
Ge																
Rb	1.31	5.57	2.69	2.86	2.66	13.3	22.3	18.5	26.8	21.2	21.1	9.85	13.2	16.2	43.0	24.0
Sr	799	1100	987	951	955	938	818	659	686	767	787	866	782	718	735	782
Y	11.1	12.6	11.8	16.9	14.7	7.78	12.4	14.0	11.2	9.30	8.49	9.69	9.88	10.4	20.0	19.0
Zr	123	78.6	120	56.8	163	20.8	108	111	87.5	104	117	91.9	140	97.3	130	145
Nb	4.39	4.80	4.63	3.93	4.92	3.34	4.60	5.78	4.43	4.15	4.08	4.64	4.33	4.89	4.60	6.50
Sn																
Cs	0.09	0.16	0.24	0.12	0.17	0.35	0.94	0.49	0.58	0.55	0.29	0.56	0.52	0.46		
Ba	245	341	425	371	414	537	788	479	730	831	543	529	380	496	989	714
La	11.8	13.6	12.8	12.5	13.7	9.50	16.5	19.3	25.3	17.2	21.4	15.3	14.6	14.4	15.1	14.8
Ce	28.7	32.0	30.1	33.3	33.6	20.9	36.4	44.0	49.6	35.3	42.4	33.0	31.6	31.9	35.9	43.7
Pr	4.12	4.52	4.14	4.95	4.75	2.83	4.68	5.68	5.68	4.30	4.84	4.26	4.17	4.16	4.60	4.30
Nd	19.3	20.7	18.9	23.0	21.7	13.0	19.9	24.4	22.3	18.0	18.7	18.0	18.1	18.4	18.9	17.7
Sm	4.11	4.36	4.01	5.19	4.61	2.83	4.08	4.92	4.02	3.37	3.21	3.48	3.78	3.61	4.10	3.40
Eu	1.58	1.73	1.73	2.11	1.83	1.42	1.64	1.72	1.55	1.49	1.42	1.62	1.66	1.69	1.70	1.40
Gd	3.41	3.78	3.27	4.54	3.86	2.44	3.30	3.84	3.28	2.73	2.50	2.92	3.10	2.99	3.60	3.10
Tb	0.46	0.49	0.45	0.63	0.55	0.32	0.47	0.56	0.45	0.38	0.34	0.41	0.42	0.44	0.40	0.40
Dy	2.33	2.53	2.36	3.28	2.82	1.63	2.44	2.75	2.34	1.93	1.75	2.03	2.14	2.20	2.30	1.90
Ho	0.42	0.46	0.42	0.58	0.52	0.30	0.45	0.52	0.42	0.35	0.32	0.37	0.39	0.41	0.40	0.30
Er	1.14	1.30	1.17	1.69	1.46	0.79	1.29	1.52	1.18	1.03	0.94	1.07	1.13	1.14	1.20	0.90
Tm	0.14	0.16	0.14	0.23	0.19	0.10	0.17	0.21	0.16	0.13	0.13	0.14	0.13	0.14	0.20	0.10
Yb	0.93	1.03	0.92	1.36	1.24	0.59	1.14	1.35	1.06	0.88	0.79	0.88	0.91	0.96	1.10	0.80
Lu	0.13	0.15	0.13	0.20	0.17	0.10	0.16	0.19	0.15	0.13	0.12	0.13	0.13	0.14	0.20	0.10
Hf	2.72	1.80	2.63	1.83	3.47	0.57	2.69	2.85	2.49	2.68	2.92	2.44	3.34	2.55	0.50	0.80
Ta	0.30	0.24	0.22	0.17	0.21	0.32	0.28	0.33	0.26	0.25	0.31	0.24	0.23	0.27	0.20	0.30

Table S3: Continuted

Location	˙ongde intrusion															
Sample	**TD38**	**TD39**	**TD40**	**TD41**	**TD42**	**TD43**	**TD43-**	**TD44**	**TD45**	**TD46**	**TD47**	**TD48**	**TD49**	**TD50**	**Gj524**	**Gj1680**
Rock type																
Reference																
Age(Ma)																
Pb	8.51	3.07	4.74	6.02	3.84	1.97	10.4	7.15	9.80	22.4	11.4	7.32	7.84	4.81	14.3	9.20
Th	0.17	0.38	0.34	0.23	0.41	0.32	2.08	1.60	6.02	2.47	2.55	1.31	1.01	0.90	1.70	0.60
U	0.11	0.18	0.15	0.26	0.35	0.40	0.76	0.90	1.07	0.98	0.84	0.55	0.43	0.36	0.70	0.20
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)														0.705120		
$\varepsilon_{Nd\ (t)}$														1.47		
Ratio																
Mg#	54.2	54.5	55.8	55.1	56.6	58.5	52.0	52.7	52.6	51.8	55.0	55.2	54.9	57.3	54.7	53.4
Sr/Y	72.3	86.9	83.8	56.3	65.0	121	66.0	47.0	61.1	82.5	92.7	89.4	79.1	69.0	36.8	41.2
Nb/La	0.37	0.35	0.36	0.31	0.36	0.35	0.28	0.30	0.18	0.24	0.19	0.30	0.30	0.34	0.30	0.44
Nb/U	39.9	26.7	30.9	15.1	14.1	8.35	6.05	6.42	4.14	4.23	4.86	8.44	10.1	13.6	6.57	32.5

Table S3: Continuted

Location																
Sample	**Gj1686**	**Gj1692**	**Gj1693**	**Gj2497**	**Gj424**	**Gj1683**	**Gj1684**	**Gj1685**	**Gj1691**	**Gj2415**	**Gj2419**	**Gj2458**	**Gj2481A**	**Gj2488**	**Gj1681**	**Gj1682**
Rock type	**Sub alkaline mafic rock**															
Reference	**Munteanu et al., 2010**															
Age(Ma)																
Major(wt.%)																
SiO_2	57.91	58.51	59.10	57.49	50.00	51.02	54.96	51.99	53.97	48.28	47.30	48.29	49.45	53.48	48.63	52.40
TiO_2	1.01	1.03	1.00	1.07	1.29	1.35	1.15	1.20	1.17	1.74	1.38	0.89	1.14	1.35	1.08	0.76
Al_2O_3	15.21	16.04	16.14	17.78	18.90	17.22	16.90	16.92	16.60	17.52	17.56	17.88	23.25	18.80	13.95	15.21
Fe2O3T	7.28	6.77	7.29	7.21	9.53	9.78	8.21	8.71	8.45	11.00	11.33	9.44	5.47	8.45	10.65	9.16
Fe_2O_3																
FeO																
MnO	0.16	0.14	0.17	0.12	0.00	0.18	0.17	0.16	0.16	0.17	0.16	0.18	0.10	0.13	0.19	0.21
MgO	4.09	3.52	3.54	3.48	5.39	5.33	4.20	5.31	4.77	6.03	6.82	7.18	2.96	2.96	9.49	7.89
CaO	5.53	6.41	5.82	6.75	9.02	8.25	7.31	8.53	7.72	8.49	9.31	9.27	11.15	7.24	10.90	8.90
Na_2O	3.44	3.43	3.24	4.27	3.68	3.77	4.04	3.67	3.50	3.67	3.05	3.51	3.41	4.61	2.26	2.74
K_2O	1.25	1.16	1.09	1.23	0.22	0.27	0.42	0.30	0.69	0.12	0.23	0.29	0.51	0.47	0.14	0.13
P_2O_5	0.28	0.26	0.28	0.31	0.36	0.34	0.27	0.28	0.31	0.49	0.35	0.13	0.17	0.37	0.23	0.12
LOI	2.07	1.02	1.22	1.12	0.44	1.05	1.06	1.51	1.38	1.39	1.35	2.06	1.37	1.84	1.26	1.25
TOL	98.23	98.29	98.89	100.83	98.83	98.56	98.69	98.58	98.72	98.90	98.84	99.12	98.98	99.70	98.78	98.77
Trace(ppm)																
Li																
Be																
Sc	12.6	11.5	12.8	14.5	21.0	20.4	13.1	16.2	19.5	21.0	25.4		15.9	12.2	52.5	28.6
V	112	120	124	140	187	199	138	168	162	208	276	152	138	122	266	161
Cr	47.2	35.8	79.7	151	83.0	67.9	42.0	73.7	71.5	148	192	159	168	105	711	244
Co	18.3	17.7	21.1	19.4	31.0	28.5	21.6	27.1	28.7	31.3	38.9	28.0	17.7	14.7	48.1	41.7
Ni	18.7	16.7	29.7	16.2	34.1	20.8	17.5	24.9	22.8	23.8	28.9	34.0	10.5	3.80	89.5	68.0
Cu																
Zn																

Table S3: Continuted

Location																
Sample	**Gj1686**	**Gj1692**	**Gj1693**	**Gj2497**	**Gj424**	**Gj1683**	**Gj1684**	**Gj1685**	**Gj1691**	**Gj2415**	**Gj2419**	**Gj2458**	**Gj2481A**	**Gj2488**	**Gj1681**	**Gj1682**
Rock type	**Sub alkaline mafic rock**															
Reference	**Munteanu et al., 2010**															
Age(Ma)																
Ga																
Ge																
Rb	31.0	29.0	25.0	31.0	8.00	7.00	11.0	9.00	18.0	8.00	9.00	7.00	14.0	11.0	6.00	6.00
Sr	564	561	700	812	951	845	789	753	876	848	797	811	727	820	441	627
Y	19.0	20.0	20.0	17.0	11.0	21.0	17.0	17.0	18.0	19.0	22.0	16.0	22.0	13.0	27.0	19.0
Zr	164	178	202	136	52.0	141	149	91.0	85.0	41.0	34.0	45.0	77.0	183	59.0	77.0
Nb	5.50	5.60	7.00	4.30	4.00	5.20	5.10	3.90	4.50	5.20	3.20	6.00	4.30	4.60	3.40	2.70
Sn																
Cs																
Ba	641	1300	1110	894	419	514	379	448	575	376	378	247	219	622	451	601
La	15.4	15.5	18.5	15.6	10.3	13.2	12.0	10.8	12.6	12.5	11.1		10.0	14.5	9.90	10.1
Ce	43.7	38.2	50.1	36.0	23.8	37.4	36.1	30.0	33.4	30.7	30.3		23.5	30.0	34.1	24.8
Pr	4.40	4.70	5.10	4.60	3.20	4.30	3.50	3.10	3.80	4.30	4.40		3.10	3.40	4.90	3.10
Nd	18.3	19.5	21.0	19.1	14.3	18.9	14.4	13.1	16.3	19.3	19.4		13.6	13.0	21.9	13.3
Sm	3.80	4.20	4.30	4.00	3.10	4.10	2.90	2.80	3.50	4.00	4.10		3.10	2.40	4.80	2.90
Eu	1.50	1.70	1.70	1.70	1.60	1.70	1.30	1.40	1.60	1.80	1.70		1.90	1.40	1.70	1.30
Gd	3.30	3.50	3.80	3.20	2.90	3.60	2.70	2.50	3.10	3.50	3.60		3.20	2.00	4.20	2.50
Tb	0.40	0.40	0.50	0.40	0.40	0.50	0.30	0.30	0.40	0.40	0.50		0.50	0.20	0.60	0.30
Dy	2.10	2.30	2.40	2.10	1.80	2.40	1.70	1.60	2.10	2.20	2.50		2.70	1.10	3.30	1.90
Ho	0.40	0.40	0.40	0.40	0.30	0.40	0.30	0.30	0.40	0.40	0.50		0.60	0.20	0.60	0.40
Er	1.10	1.10	1.20	1.00	0.90	1.20	0.80	0.80	1.00	1.00	1.30		1.50	0.60	1.70	1.00
Tm	0.10	0.20	0.20	0.10	0.10	0.20	0.10	0.10	0.10	0.10	0.20		0.20	0.10	0.20	0.20
Yb	0.90	0.90	1.00	0.90	0.70	0.90	0.70	0.60	0.80	0.80	1.10		1.30	0.50	1.50	1.00
Lu	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.20		0.20	0.10	0.20	0.20
Hf	0.80	1.30	0.90	0.80	0.50	0.90	0.80	0.90	0.70	0.50	1.10		0.60	1.30	1.40	1.20
Ta	0.30	0.30	0.30	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.10		0.20	0.30	0.10	0.10

Table S3: Continuted

Location																
Sample	**Gj1686**	**Gj1692**	**Gj1693**	**Gj2497**	**Gj424**	**Gj1683**	**Gj1684**	**Gj1685**	**Gj1691**	**Gj2415**	**Gj2419**	**Gj2458**	**Gj2481A**	**Gj2488**	**Gj1681**	**Gj1682**
Rock type	**Sub alkaline mafic rock**															
Reference	**Munteanu et al., 2010**															
Age(Ma)																
Pb	9.40	9.40	20.1	10.8	3.90	6.50	8.10	7.30	6.80	2.60	3.00		5.60	6.70	3.30	5.30
Th	2.70	1.20	1.10	1.30	0.20	0.30	0.70	0.70	1.00		0.10		0.40	0.50	0.10	0.20
U	1.20	0.30	0.30	0.50	0.10	0.10	0.30	0.30	0.30				0.10	0.20		0.10
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)																
$\varepsilon_{Nd\ (t)}$																
Ratio																
Mg#	56.7	54.8	53.1	52.9	56.9	55.9	54.4	58.7	56.8	56.1	58.4	63.9	55.8	44.9	67.5	66.7
Sr/Y	29.7	28.1	35.0	47.8	86.5	40.2	46.4	44.3	48.7	44.6	36.2	50.7	33.0	63.1	16.3	33.0
Nb/La	0.36	0.36	0.38	0.28	0.39	0.39	0.43	0.36	0.36	0.42	0.29		0.43	0.32	0.34	0.27
Nb/U	4.58	18.7	23.3	8.60	40.0	52.0	17.0	13.0	15.0				43.0	23.0		27.0

Table S3:

Location	Dadukou intrusion															
Sample	**DDK-10**	**DDK-11**	**DDK-12**	**DDK-15**	**DDK-16**	**DDK-17**	**DDK-18**	**DDK-19**	**DDK-20**	**DDK-21**	**DDK-22**	**DDK-23A**	**DDK-23B**	**DDK-24**	**DDK-26**	**DDK-28**
Rock type	**Sub alkaline mafic rock**															
Reference	**Zhao and Zhou, 2007**															
Age(Ma)		**745**														
Major(wt.%)																
SiO_2	50.63	49.82	48.88	49.06	48.19	48.67	48.74	49.90	49.36	49.38	48.01	50.90	47.97	48.90	49.02	49.46
TiO_2	1.40	1.03	1.07	0.98	1.16	1.22	1.13	1.15	1.52	1.16	1.25	0.98	1.01	1.16	2.33	1.75
Al_2O_3	15.56	15.77	17.08	15.65	16.17	16.22	15.98	15.57	15.94	16.20	16.95	15.58	16.33	16.14	14.73	15.21
Fe2O3T	13.83	12.44	11.24	11.74	12.49	12.05	12.21	12.27	14.09	12.16	12.73	12.05	11.60	12.02	16.78	15.09
Fe_2O_3																
FeO																
MnO	0.25	0.21	0.17	0.19	0.20	0.19	0.20	0.21	0.24	0.20	0.21	0.21	0.18	0.19	0.27	0.24
MgO	4.82	6.36	6.24	6.56	7.21	6.99	6.87	6.92	5.56	6.60	7.07	6.20	7.70	6.84	4.40	4.62
CaO	9.28	10.25	11.37	11.11	10.51	10.96	10.84	10.59	9.95	10.67	10.30	9.94	11.01	10.76	9.17	9.07
Na_2O	3.62	3.01	3.16	2.79	2.76	2.91	3.05	2.89	3.08	2.90	2.95	3.01	2.63	2.81	3.09	3.29
K_2O	0.42	0.37	0.30	0.33	0.37	0.29	0.26	0.27	0.25	0.27	0.34	0.31	0.35	0.29	0.33	0.42
P_2O_5	0.28	0.16	0.16	0.15	0.19	0.20	0.20	0.16	0.27	0.20	0.17	0.15	0.18	0.18	0.41	0.31
LOI	0.49	0.54	1.30	0.60	0.58	0.59	0.41	0.45	-0.09	0.32	0.54	0.52	0.57	0.49	-0.10	0.20
TOL	100.58	99.97	100.97	99.16	99.82	100.29	99.91	100.40	100.15	100.06	100.53	99.87	99.54	99.79	100.42	99.65
Trace(ppm)																
Li																
Be																
Sc	39.7	37.9	37.3	36.0	35.6	37.5	36.6	37.8	41.3	38.4	38.8	36.8	33.1	35.9	38.5	38.6
V	280	262	267	251	252	270	252	279	321	265	278	257	221	240	312	293
Cr	19.3	53.5	136	166	129	126	129	132	23.9	112	191	53.5	236	135	27.5	125
Co	33.9	38.0	34.5	36.1	41.1	40.6	39.5	40.4	40.0	43.0	40.8	38.0	41.8	38.7	34.9	36.8
Ni	4.99	10.3	15.4	17.7	21.8	20.7	23.0	23.9	7.69	22.2	28.6	10.1	39.1	26.4	12.5	36.5
Cu																
Zn																

Table S3:

Location	Dadukou intrusion															
Sample	**DDK-10**	**DDK-11**	**DDK-12**	**DDK-15**	**DDK-16**	**DDK-17**	**DDK-18**	**DDK-19**	**DDK-20**	**DDK-21**	**DDK-22**	**DDK-23A**	**DDK-23B**	**DDK-24**	**DDK-26**	**DDK-28**
Rock type	**Sub alkaline mafic rock**															
Reference	**Zhao and Zhou, 2007**															
Age(Ma)		**745**														
Ga																
Ge																
Rb	2.01	2.44	0.96	1.16	1.68	0.90	0.91	0.84	1.32	0.80	1.45	1.62	1.52	1.31	1.88	2.56
Sr	364	337	347	331	328	345	350	333	393	341	319	343	352	350	335	332
Y	25.9	21.2	22.3	20.6	21.8	22.5	21.5	24.8	31.7	26.5	25.7	20.9	19.6	24.0	37.3	38.8
Zr	136	58.0	65.0	58.0	72.0	61.0	65.0	39.0	73.0	84.0	67.0	55.0	66.0	51.0	108	83.0
Nb	5.59	2.95	3.85	2.76	2.94	2.95	2.86	4.27	5.96	3.52	3.70	2.83	2.57	3.47	8.30	5.99
Sn																
Cs	0.04	0.05	0.05	0.02	0.02	0.02	0.01	0.02	0.04	0.02	0.03	0.03	0.01	0.04	0.08	0.05
Ba	355	262	177	177	228	215	220	267	274	237	241	268	210	242	435	503
La	16.6	10.9	10.4	10.2	9.20	9.50	9.90	13.4	14.2	11.4	11.2	10.2	7.94	12.3	20.0	19.2
Ce	34.2	24.7	25.0	23.6	22.3	22.9	22.8	31.0	32.9	26.5	26.8	22.8	19.3	28.6	46.6	45.1
Pr	4.43	3.26	3.38	3.16	3.09	3.14	3.14	4.21	4.61	3.67	3.68	3.05	2.69	3.88	6.47	6.39
Nd	19.8	14.3	14.8	14.0	14.2	14.5	14.3	18.3	21.2	16.4	16.8	13.7	12.4	17.0	30.3	29.2
Sm	4.68	3.57	3.72	3.35	3.64	3.68	3.65	4.35	5.34	4.12	4.09	3.35	3.19	4.13	7.30	7.26
Eu	1.83	1.30	1.37	1.29	1.42	1.36	1.43	1.59	1.65	1.39	1.39	1.20	1.24	1.40	2.84	2.52
Gd	4.85	3.89	4.10	3.68	4.04	4.23	3.95	4.57	5.66	4.49	4.53	3.72	3.66	4.45	7.73	7.77
Tb	0.82	0.65	0.68	0.62	0.66	0.68	0.64	0.73	0.91	0.73	0.71	0.61	0.60	0.73	1.21	1.27
Dy	4.90	3.96	4.21	3.87	4.12	4.20	4.00	4.61	5.55	4.53	4.53	3.81	3.77	4.60	7.51	7.68
Ho	1.01	0.83	0.89	0.79	0.86	0.87	0.85	0.93	1.16	0.92	0.91	0.79	0.77	0.93	1.50	1.54
Er	3.06	2.54	2.67	2.50	2.64	2.59	2.52	2.80	3.50	2.79	2.81	2.45	2.31	2.88	4.54	4.67
Tm	0.43	0.36	0.38	0.35	0.37	0.37	0.36	0.41	0.47	0.38	0.39	0.34	0.32	0.40	0.61	0.63
Yb	2.75	2.38	2.59	2.35	2.39	2.33	2.23	2.62	3.00	2.55	2.51	2.30	2.09	2.62	3.93	4.02
Lu	0.43	0.36	0.38	0.34	0.35	0.35	0.34	0.40	0.46	0.38	0.36	0.34	0.31	0.41	0.62	0.59
Hf	3.12	1.95	2.09	1.87	2.18	1.98	2.02	1.37	1.79	2.15	1.91	1.66	2.02	1.92	2.85	2.36
Ta	0.29	0.19	0.20	0.16	0.17	0.18	0.19	0.26	0.32	0.18	0.32	0.17	0.16	0.21	0.46	0.34

Table S3:

Location	Dadukou intrusion															
Sample	**DDK-10**	**DDK-11**	**DDK-12**	**DDK-15**	**DDK-16**	**DDK-17**	**DDK-18**	**DDK-19**	**DDK-20**	**DDK-21**	**DDK-22**	**DDK-23A**	**DDK-23B**	**DDK-24**	**DDK-26**	**DDK-28**
Rock type	Sub alkaline mafic rock															
Reference	Zhao and Zhou, 2007															
Age(Ma)		**745**														
Pb	4.47	3.08	2.19	2.49	1.74	2.11	2.16	2.56	2.57	2.13	2.69	3.08	2.03	2.33	3.89	4.42
Th	0.53	0.39	0.40	0.28	0.22	0.16	0.13	0.24	0.65	0.69	0.67	0.70	0.48	0.56	0.63	0.41
U	0.76	0.56	1.14	0.27	1.42	0.44	0.24	0.49	1.20	1.31	1.37	1.34	1.03	0.91	0.62	0.23
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)		0.707227							0.707186						0.706998	
$\varepsilon_{Nd\ (t)}$		-0.64							-1.73						-1.02	
Ratio																
Mg#	44.8	54.4	56.4	56.6	57.4	57.5	56.7	56.8	47.9	55.8	56.4	54.5	60.7	57.0	37.9	41.6
Sr/Y	14.1	15.9	15.6	16.1	15.0	15.3	16.3	13.4	12.4	12.9	12.4	16.4	18.0	14.6	8.98	8.56
Nb/La	0.34	0.27	0.37	0.27	0.32	0.31	0.29	0.32	0.42	0.31	0.33	0.28	0.32	0.28	0.42	0.31
Nb/U	7.36	5.27	3.38	10.2	2.07	6.70	11.9	8.71	4.97	2.69	2.70	2.11	2.50	3.81	13.4	26.0

Table S3: Continuted

Location										Qizanmi intrusion					
Sample	DDK-32	DDK-33	DDK-34	DDK-35	DDK-36	DDK-37	DDK-38	DDK-39	DDK-40	13AL02-3	13AL02-4	13AL02-5	13AL02-6	11AL15-1	11AL15-2
Rock type										Sub alkaline mafic rock					
Reference										Liu et al., 2019					
Age(Ma)														748	
Major(wt.%)															
SiO_2	49.77	48.34	48.68	49.83	49.23	49.32	47.95	48.82	49.28	49.30	47.90	48.20	49.40	49.70	49.70
TiO_2	1.42	1.31	1.69	1.46	1.46	2.05	2.11	1.54	1.24	0.27	0.25	0.49	0.21	0.57	0.56
Al_2O_3	15.60	16.24	16.33	15.05	15.29	15.59	16.12	15.75	15.56	24.00	20.80	17.60	17.50	19.20	19.20
Fe2O3T	13.40	13.43	15.10	14.27	14.79	16.44	17.25	14.37	13.24	1.16	1.57	3.91	3.16	3.29	3.44
Fe_2O_3															
FeO										2.95	4.12	5.89	6.03	3.85	3.72
MnO	0.23	0.21	0.24	0.26	0.25	0.35	0.25	0.25	0.21	0.06	0.08	0.15	0.14	0.11	0.11
MgO	5.73	5.74	4.67	5.69	5.73	3.30	3.73	5.11	7.00	6.34	9.59	7.51	8.13	7.04	7.02
CaO	9.81	9.98	9.67	9.87	9.18	8.54	8.86	9.79	10.22	11.34	9.67	9.85	8.50	10.08	9.76
Na_2O	3.22	3.06	3.11	2.97	3.14	3.83	3.45	3.16	2.81	2.73	2.26	2.57	2.91	2.22	2.26
K_2O	0.34	0.37	0.19	0.24	0.31	0.28	0.27	0.26	0.29	0.29	0.44	0.22	0.29	1.34	1.46
P_2O_5	0.22	0.19	0.30	0.12	0.22	0.59	0.52	0.25	0.19	0.05	0.05	0.02	0.03	0.06	0.06
LOI	0.29	0.99	0.40	0.57	0.06	-0.36	-0.19	0.46	0.72	1.16	2.66	1.87	2.02	2.02	2.27
TOL	100.03	99.87	100.36	100.34	99.67	99.93	100.30	99.77	100.75	99.60	99.50	98.30	98.20	99.50	99.50
Trace(ppm)															
Li										4.06	25.3	8.46	8.15	11.8	13.0
Be										0.28	0.31	0.37	0.44	0.48	0.53
Sc	39.3	41.4	39.5	53.8	40.4	42.3	37.4	39.4	39.5	5.80	6.10	27.9	26.3	25.5	25.1
V	283	327	358	337	358	144	190	312	259	41.5	29.0	36.8	212	144	147
Cr	36.0	19.1	6.80	11.5	7.60	4.60	5.60	7.70	38.3	228	269	175	293	66.4	69.5
Co	41.3	40.1	38.9	42.6	42.6	25.2	37.0	36.7	41.7	29.1	50.0	41.9	38.4	37.8	38.8
Ni	12.5	13.4	4.76	8.06	6.20	2.52	3.36	5.30	11.4	217	304	104	70.6	74.5	80.1
Cu										40.4	80.0	73.6	29.6	53.4	45.7
Zn										31.6	44.2	57.6	60.5	49.9	52.9

Table S3: Continuted

Location										Qizanmi intrusion					
Sample	DDK-32	DDK-33	DDK-34	DDK-35	DDK-36	DDK-37	DDK-38	DDK-39	DDK-40	13AL02-3	13AL02-4	13AL02-5	13AL02-6	11AL15-1	11AL15-2
Rock type										Sub alkaline mafic rock					
Reference										Liu et al., 2019					
Age(Ma)														748	
Ga										16.0	15.3	18.9	18.7	18.3	18.1
Ge															
Rb	0.97	2.36	1.15	1.13	1.52	0.96	2.02	1.40	1.85	5.68	14.0	4.56	7.03	38.9	43.4
Sr	357	383	408	387	421	424	405	355	321	623	522	644	578	559	547
Y	26.4	24.4	15.8	31.1	26.6	25.4	24.2	33.0	41.3	4.46	4.39	8.53	7.10	8.23	8.18
Zr	74.0	84.0	78.0	45.0	44.0	130	218	45.0	64.0	23.2	25.2	18.2	13.4	20.0	19.8
Nb	5.36	3.37	3.97	5.47	5.06	12.9	6.61	6.31	3.76	1.00	0.90	1.00	0.80	0.90	0.90
Sn										0.33	0.35	0.57	0.50	0.37	0.39
Cs	0.02	0.04	0.05	0.04	0.05	0.02	0.07	0.06	0.04	1.18	1.27	0.31	0.53	0.50	0.56
Ba	299	227	225	270	346	360	329	279	249	89.4	115	45.7	97.9	269	296
La	12.9	10.6	11.2	11.0	12.8	21.5	18.7	14.4	16.2	4.12	3.82	2.80	2.77	4.94	4.85
Ce	29.3	24.9	22.3	26.2	29.5	44.9	40.4	35.0	44.3	8.20	7.60	5.80	5.30	10.8	10.9
Pr	3.90	3.42	2.78	3.90	4.13	5.68	5.27	5.06	6.50	1.04	0.97	0.84	0.73	1.44	1.45
Nd	17.3	15.2	11.9	18.8	18.6	26.9	24.0	24.3	30.4	4.19	4.00	4.01	3.45	6.57	6.59
Sm	4.30	3.76	2.80	5.07	4.62	6.45	5.27	6.23	7.56	0.85	0.86	1.24	0.99	1.58	1.62
Eu	1.77	1.48	1.47	1.68	1.76	3.47	2.39	2.12	1.72	0.56	0.54	0.82	0.73	0.73	0.73
Gd	4.84	4.16	3.16	5.58	5.00	6.72	5.58	6.64	8.05	0.89	0.91	1.41	1.13	1.61	1.63
Tb	0.78	0.70	0.49	0.92	0.78	0.96	0.82	1.07	1.28	0.15	0.15	0.26	0.20	0.26	0.27
Dy	4.68	4.27	2.91	5.72	4.97	5.43	4.84	6.63	8.02	0.86	0.89	1.64	1.36	1.53	1.53
Ho	0.96	0.87	0.58	1.15	0.99	1.04	0.98	1.35	1.61	0.18	0.18	0.34	0.28	0.30	0.32
Er	2.89	2.64	1.72	3.42	2.92	2.89	2.82	3.98	4.80	0.49	0.46	0.91	0.83	0.87	0.89
Tm	0.41	0.38	0.24	0.47	0.42	0.37	0.38	0.53	0.66	0.07	0.07	0.14	0.12	0.11	0.12
Yb	2.70	2.49	1.61	3.02	2.74	2.44	2.46	3.36	4.24	0.43	0.42	0.92	0.80	0.79	0.72
Lu	0.39	0.36	0.24	0.44	0.40	0.37	0.37	0.50	0.61	0.06	0.07	0.13	0.12	0.11	0.11
Hf	2.02	2.27	1.99	1.51	1.31	3.00	4.58	1.60	2.45	0.56	0.58	0.61	0.44	0.66	0.65
Ta	0.25	0.17	0.21	0.27	0.24	0.42	0.34	0.31	0.23	0.07	0.06	0.07	0.06	0.06	0.06

Table S3: Continuted

Location										Qizanmi intrusion					
Sample	DDK-32	DDK-33	DDK-34	DDK-35	DDK-36	DDK-37	DDK-38	DDK-39	DDK-40	13AL02-3	13AL02-4	13AL02-5	13AL02-6	11AL15-1	11AL15-2
Rock type										Sub alkaline mafic rock					
Reference										Liu et al., 2019					
Age(Ma)														748	
Pb	2.76	2.41	2.26	2.74	2.88	3.33	3.44	3.06	2.35	4.56	3.24	3.46	2.49	2.69	2.66
Th	0.63	0.50	0.54	0.62	0.85	0.61	0.86	0.52	0.34	0.55	0.43	0.06	0.06	0.21	0.20
U	0.95	0.70	0.76	0.89	0.87	0.84	1.00	0.49	0.41	0.10	0.10	0.02	0.06	0.04	0.04
Isotopic date															
$^{87}Sr/^{86}Sr$ (t)					0.707460					0.7040		0.7049		0.7051	0.7047
$\varepsilon_{Nd\ (t)}$					1.19					1.70		0.80		0.50	0.40
Ratio															
Mg#	49.9	49.9	41.9	48.2	47.4	31.9	33.5	45.3	55.2	92.7	93.4	81.7	85.7	83.3	82.6
Sr/Y	13.5	15.7	25.8	12.4	15.8	16.7	16.7	10.8	7.77	140	119	75.5	81.4	67.9	66.9
Nb/La	0.42	0.32	0.35	0.50	0.40	0.60	0.35	0.44	0.23	0.24	0.24	0.36	0.29	0.18	0.19
Nb/U	5.64	4.81	5.22	6.15	5.82	15.3	6.61	12.9	9.17	10.0	9.00	50.0	13.3	22.5	22.5

Table S3: Continuted

Location																
Sample	**YB1**	**YB2**	**YB3**	**YB4**	**YB5**	**YB6**	**YB7**	**YB9**	**YB10**	**YB11**	**YB12**	**YB13**	**YB14**	**YB15**	**YB16**	**YB17**
Rock type																
Reference																
Age(Ma)	**840**															
Major(wt.%)																
SiO_2	44.89	46.14	44.67	44.65	45.17	44.32	45.74	44.87	46.17	43.93	45.43	44.95	46.06	43.98	45.84	45.77
TiO_2	2.27	2.36	1.73	2.29	2.02	2.27	1.98	1.91	1.81	1.98	1.93	1.84	1.98	1.90	1.89	1.64
Al_2O_3	15.24	15.38	16.07	15.06	15.30	14.43	15.61	15.55	15.01	15.93	15.33	15.35	15.42	15.13	15.28	14.22
Fe2O3T	12.22	12.80	10.70	12.84	11.96	13.97	12.84	12.66	12.48	13.31	13.48	12.43	12.72	13.27	12.57	13.80
Fe_2O_3																
FeO																
MnO	0.20	0.20	0.19	0.20	0.19	0.20	0.18	0.18	0.18	0.19	0.19	0.16	0.22	0.19	0.21	0.19
MgO	7.32	8.30	8.33	7.07	7.65	7.52	6.24	5.16	5.45	6.86	5.91	5.58	6.29	6.75	6.80	7.24
CaO	11.60	10.92	10.88	9.51	10.07	8.87	10.21	14.63	13.51	10.63	11.78	15.08	10.64	13.24	11.96	10.98
Na_2O	1.90	2.04	2.22	3.18	2.78	2.65	2.93	1.22	1.70	2.48	2.43	1.09	2.75	1.24	1.97	2.13
K_2O	0.28	0.24	0.95	0.21	0.69	0.39	0.16	0.06	0.09	0.07	0.11	0.06	0.18	0.15	0.28	0.14
P_2O_5	0.26	0.26	0.18	0.26	0.24	0.33	0.18	0.19	0.18	0.18	0.18	0.17	0.18	0.18	0.16	0.17
LOI	3.28	0.64	3.39	3.41	3.01	3.80	3.29	2.51	2.30	3.37	2.80	2.15	2.63	2.73	2.40	2.97
TOL	99.46	99.27	99.31	98.68	99.08	98.78	99.36	98.93	98.88	98.93	99.56	98.87	99.07	98.77	99.38	99.26
Trace(ppm)																
Li																
Be																
Sc	36.8	37.8	35.2	42.1	36.2	35.3	41.8	37.9	36.6	40.0	38.2	35.7	40.1	40.6	42.6	43.9
V	354	379	315	389	348	375	349	332	315	361	326	329	343	353	354	404
Cr	109	114	61.0	107	99.0	176	134	128	124	125	124	122	133	137	141	183
Co	45.8	45.7	50.5	50.7	51.6	51.4	46.9	43.8	43.5	44.4	43.9	44.7	47.8	49.7	48.3	43.0
Ni	73.1	65.0	182	57.3	87.8	105	81.8	69.5	90.3	72.9	68.1	66.1	71.6	76.6	65.6	63.4
Cu	71.4	73.6	75.3	91.1	80.6	66.1	72.3	72.9	65.8	73.1	74.2	71.7	71.0	74.9	75.8	92.7
Zn	131	114	104	125	119	135	119	106	99.0	110	135	91.0	113	121	111	123

Table S3: Continuted

Location																
Sample	**YB1**	**YB2**	**YB3**	**YB4**	**YB5**	**YB6**	**YB7**	**YB9**	**YB10**	**YB11**	**YB12**	**YB13**	**YB14**	**YB15**	**YB16**	**YB17**
Rock type																
Reference																
Age(Ma)	**840**															
Ga																
Ge																
Rb	5.88	3.80	19.8	2.88	11.5	5.90	1.97	0.65	2.77	0.80	1.46	0.67	2.17	2.55	8.57	2.25
Sr	452	311	603	292	364	256	254	488	430	255	295	424	242	377	279	230
Y	30.1	30.3	22.5	29.5	25.9	34.3	32.7	31.6	30.2	33.0	31.5	30.1	32.3	32.5	31.5	33.0
Zr	170	163	123	165	148	141	121	118	111	121	120	112	119	124	118	77.0
Nb	5.79	5.57	5.19	6.91	5.39	4.76	3.16	3.01	2.83	2.93	3.01	2.75	2.85	3.06	3.17	1.84
Sn																
Cs	0.16	0.11	0.40	0.15	0.26	0.10	0.03	0.02	0.09	0.02	0.04	0.03	0.04	0.05	0.27	0.06
Ba	53.2	37.8	97.2	63.4	112	124	28.8	15.1	20.2	13.8	17.8	13.0	28.1	19.7	36.5	54.0
La	9.45	8.76	7.28	8.98	7.69	9.19	5.09	5.32	5.21	5.38	5.24	5.04	5.35	5.30	5.44	4.69
Ce	26.1	24.2	19.9	24.7	21.4	24.4	16.1	16.3	15.7	16.7	16.0	15.3	16.4	16.2	16.2	12.9
Pr	3.98	3.73	2.95	3.76	3.29	3.77	2.68	2.68	2.59	2.76	2.69	2.54	2.77	2.73	2.59	2.13
Nd	19.5	18.4	14.3	18.2	16.0	18.8	14.2	14.2	13.6	14.8	14.2	13.4	14.5	14.2	13.6	11.5
Sm	5.37	5.17	3.92	5.03	4.39	5.52	4.62	4.57	4.39	4.75	4.57	4.29	4.73	4.55	4.43	3.84
Eu	1.93	1.74	1.39	1.79	1.53	1.94	1.59	1.62	1.62	1.72	1.66	1.53	1.71	1.66	1.59	1.34
Gd	5.94	5.79	4.30	5.61	4.91	6.37	5.71	5.72	5.40	5.94	5.65	5.40	5.77	5.66	5.32	5.01
Tb	0.94	0.92	0.68	0.88	0.78	1.01	0.96	0.96	0.91	1.00	0.97	0.91	0.99	0.97	0.90	0.87
Dy	5.76	5.57	3.96	5.20	4.62	6.17	6.21	6.00	5.75	6.33	6.07	5.78	6.18	6.03	5.63	5.62
Ho	1.13	1.06	0.78	0.99	0.88	1.22	1.26	1.25	1.18	1.29	1.23	1.18	1.26	1.25	1.15	1.14
Er	3.17	3.09	2.24	2.87	2.57	3.60	3.68	3.69	3.56	3.88	3.66	3.47	3.81	3.71	3.40	3.52
Tm	0.43	0.41	0.29	0.39	0.34	0.50	0.51	0.50	0.49	0.53	0.51	0.49	0.53	0.50	0.47	0.50
Yb	2.70	2.64	1.84	2.45	2.11	3.20	3.22	3.33	3.19	3.47	3.28	3.12	3.33	3.15	3.12	3.30
Lu	0.40	0.37	0.26	0.35	0.31	0.47	0.48	0.49	0.47	0.49	0.48	0.45	0.50	0.48	0.44	0.47
Hf	4.21	3.88	2.94	3.54	3.21	3.50	3.42	3.31	3.26	3.39	3.39	3.24	3.41	3.22	3.16	2.19
Ta	0.44	0.41	0.37	0.43	0.36	0.34	0.49	0.26	0.26	0.26	0.26	0.25	0.26	0.27	0.26	0.14

Table S3: Continuted

Location																
Sample	**YB1**	**YB2**	**YB3**	**YB4**	**YB5**	**YB6**	**YB7**	**YB9**	**YB10**	**YB11**	**YB12**	**YB13**	**YB14**	**YB15**	**YB16**	**YB17**
Rock type																
Reference																
Age(Ma)	**840**															
Pb	1.94	0.77	1.21	0.69	0.95	1.67	0.61	1.07	1.65	0.75	0.92	1.45	0.95	1.00	1.81	0.79
Th	0.49	0.25	0.21	0.26	0.32	0.48	0.30	0.29	0.59	0.29	0.24	0.21	0.22	0.20	0.84	0.19
U	0.11	0.03	0.060	0.15	0.36	0.33	0.38	0.31	0.49	0.34	0.20	0.11	0.12	0.14	0.27	0.20
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)							0.703216			0.702995						
$\varepsilon_{Nd\ (t)}$							8.02			7.21						
Ratio																
Mg#	58.3	60.2	64.5	56.2	59.9	55.6	53.1	48.7	50.4	54.6	50.5	51.1	53.5	54.2	55.8	55.0
Sr/Y	15.0	10.3	26.8	9.90	14.1	7.46	7.77	15.4	14.2	7.73	9.37	14.1	7.49	11.6	8.86	6.97
Nb/La	0.61	0.64	0.71	0.77	0.70	0.52	0.62	0.57	0.54	0.54	0.57	0.55	0.53	0.58	0.58	0.39
Nb/U	52.6	186	86.5	46.1	15.0	14.4	8.32	9.71	5.78	8.62	15.1	25.0	23.8	21.9	11.7	9.20

Table S3: Continuted

Location	Yanbian basalt															
Sample	**YB18**	**YB19**	**YB20**	**YB21**	**YB22**	**YB23**	**B23-2**	**YB24**	**YB25**	**YB26**	**YB29**	**YB31**	**YB32**	**YB33**	**YB34**	**YB36**
Rock type	Sub alkaline mafic rock															
Reference	Sun et al., 2007															
Age(Ma)																
Major(wt.%)																
SiO_2	47.08	44.95	43.91	46.36	45.43	46.27	45.99	47.34	46.49	44.63	47.13	45.04	45.77	44.89	46.18	47.49
TiO_2	1.70	1.93	1.90	1.65	1.66	1.86	1.69	2.03	1.84	2.07	1.69	1.44	1.40	1.46	1.38	1.59
Al_2O_3	14.47	14.89	15.87	14.29	15.57	14.60	15.19	13.35	14.07	13.95	14.37	14.98	15.15	15.53	15.06	14.67
Fe2O3T	11.88	12.79	13.33	13.79	12.54	13.78	12.54	13.59	12.45	13.69	12.21	12.29	12.19	12.39	12.00	12.85
Fe_2O_3																
FeO																
MnO	0.18	0.20	0.20	0.21	0.21	0.21	0.20	0.21	0.19	0.25	0.19	0.22	0.17	0.19	0.19	0.26
MgO	6.42	7.78	8.25	7.12	6.56	6.36	6.88	6.51	7.15	6.78	6.63	8.11	7.08	6.96	7.68	7.78
CaO	13.05	11.83	11.13	11.75	12.15	10.08	11.27	11.21	11.19	11.85	10.93	8.58	10.97	11.80	11.03	7.67
Na_2O	1.51	1.90	1.79	1.84	2.00	2.93	2.31	2.23	2.18	2.32	2.27	2.10	2.52	2.16	1.91	2.87
K_2O	0.12	0.28	0.29	0.17	0.52	0.18	0.15	0.30	0.19	0.14	0.42	0.86	0.30	0.23	0.29	0.58
P_2O_5	0.16	0.17	0.18	0.17	0.22	0.26	0.21	0.26	0.23	0.27	0.24	0.19	0.19	0.20	0.15	0.20
LOI	2.40	2.91	3.16	2.49	2.67	3.13	2.46	2.18	2.60	2.67	2.82	4.77	3.07	3.06	3.33	3.46
TOL	98.98	99.63	100.02	99.84	99.52	99.64	98.89	99.20	98.60	98.63	98.91	98.58	98.82	98.88	99.20	99.41
Trace(ppm)																
Li																
Be																
Sc	38.5	42.9	42.4	44.6	40.6	42.7	35.3	42.8	40.9	42.7	39.2	43.0	42.8	41.1	38.0	40.1
V	342	371	365	403	353	489	315	398	363	402	353	370	355	356	321	364
Cr	127	141	145	179	263	55.0	230	205	238	217	206	239	230	222	266	203
Co	41.4	56.0	60.0	54.4	44.2	45.9	46.4	42.2	35.7	39.2	36.6	48.2	43.9	44.9	33.3	24.6
Ni	69.5	83.0	108	74.8	91.0	38.1	97.9	59.8	73.3	62.2	62.7	79.0	77.2	73.5	94.9	60.1
Cu	75.8	92.7	79.0	91.9	64.7	80.8	66.5	87.2	61.8	87.8	68.4	76.8	86.3	50.1	77.8	59.1
Zn	111	123	134	146	125	158	112	124	111	118	130	150	83.0	90.0	119	105

Table S3: Continuted

Location	Yanbian basalt															
Sample	**YB18**	**YB19**	**YB20**	**YB21**	**YB22**	**YB23**	**B23-2**	**YB24**	**YB25**	**YB26**	**YB29**	**YB31**	**YB32**	**YB33**	**YB34**	**YB36**
Rock type	Sub alkaline mafic rock															
Reference	Sun et al., 2007															
Age(Ma)																
Ga																
Ge																
Rb	2.38	5.65	5.62	2.84	9.00	4.37	1.94	3.58	1.79	1.35	5.75	20.5	3.83	3.05	5.18	12.0
Sr	350	274	225	221	346	280	402	247	238	354	258	391	313	449	292	239
Y	30.1	32.8	32.2	32.4	31.6	54.9	30.3	40.1	36.8	41.8	35.2	29.9	28.9	28.5	23.0	28.3
Zr	109	121	122	77.0	93.0	193	87.0	129	117	135	111	80.0	82.0	79.0	63.0	78.0
Nb	2.64	2.92	2.92	1.82	2.65	4.84	2.48	3.42	3.13	3.44	3.35	2.31	2.34	2.28	1.74	2.35
Sn																
Cs	0.09	0.08	0.13	0.10	0.17	0.31	0.05	0.11	0.04	0.07	0.07	0.61	0.07	0.08	0.13	0.22
Ba	18.8	28.6	33.3	59.4	265	140	75.0	146	108	73.5	201	287	107	110	103	236
La	4.54	5.05	4.83	4.38	6.16	12.7	6.08	9.22	8.18	8.75	9.00	6.13	6.33	6.06	4.35	6.46
Ce	13.9	15.2	15.0	12.1	16.8	33.1	16.6	23.7	21.2	23.5	22.7	15.8	15.9	15.6	11.6	16.8
Pr	2.33	2.51	2.47	2.03	2.64	5.00	2.67	3.62	3.25	3.65	3.43	2.42	2.41	2.41	1.83	2.59
Nd	12.1	13.2	12.9	10.8	13.7	25.0	13.9	18.2	16.8	18.7	17.0	12.0	12.1	12.1	9.60	13.2
Sm	3.77	4.23	4.16	3.70	4.32	7.66	4.22	5.66	5.24	5.82	5.08	3.66	3.68	3.67	3.10	4.15
Eu	1.57	1.54	1.45	1.36	1.57	2.49	1.46	1.86	1.76	2.01	1.60	1.33	1.32	1.38	1.17	1.50
Gd	4.98	5.23	5.18	4.70	5.21	9.40	5.27	7.12	6.49	7.20	6.09	4.51	4.60	4.63	3.95	5.00
Tb	0.80	0.87	0.88	0.82	0.89	1.58	0.88	1.16	1.08	1.22	1.03	0.76	0.76	0.79	0.65	0.85
Dy	4.99	5.56	5.42	5.30	5.68	9.95	5.69	7.43	7.12	7.85	6.48	4.74	4.84	4.89	4.16	5.44
Ho	1.02	1.11	1.11	1.09	1.15	2.05	1.17	1.55	1.44	1.63	1.34	0.99	0.98	0.99	0.84	1.11
Er	2.98	3.37	3.22	3.38	3.43	6.17	3.58	4.68	4.44	4.87	4.10	2.95	2.97	3.00	2.52	3.35
Tm	0.42	0.45	0.45	0.46	0.49	0.86	0.50	0.64	0.60	0.69	0.57	0.42	0.40	0.43	0.36	0.46
Yb	2.68	2.79	2.84	2.95	2.98	5.79	3.35	4.27	4.07	4.49	3.70	2.61	2.65	2.72	2.36	3.06
Lu	0.38	0.42	0.42	0.45	0.45	0.82	0.47	0.64	0.59	0.66	0.55	0.39	0.39	0.40	0.34	0.45
Hf	2.67	3.02	2.89	2.03	2.54	5.14	2.67	3.72	3.50	3.94	3.34	2.02	2.04	2.19	1.81	2.49
Ta	0.21	0.22	0.21	0.13	0.19	0.37	0.19	0.26	0.23	0.26	0.23	0.17	0.17	0.17	0.15	0.18

Table S3: Continuted

Location	Yanbian basalt															
Sample	**YB18**	**YB19**	**YB20**	**YB21**	**YB22**	**YB23**	**B23-2**	**YB24**	**YB25**	**YB26**	**YB29**	**YB31**	**YB32**	**YB33**	**YB34**	**YB36**
Rock type	**Sub alkaline mafic rock**															
Reference	**Sun et al., 2007**															
Age(Ma)																
Pb	1.14	1.17	0.77	0.76	1.83	2.81	1.71	1.98	1.18	3.27	3.27	2.45	0.88	1.75	2.15	1.14
Th	0.20	0.25	0.36	0.31	0.41	1.15	0.31	1.13	0.81	0.83	0.64	0.32	0.37	0.52	0.47	0.61
U	0.22	0.36	0.60	0.51	0.44	0.53	0.21	0.75	0.54	0.42	0.27	0.42	0.55	0.74	0.82	0.77
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)	0.703284			0.703509							0.703638					0.704026
$\varepsilon_{Nd\ (t)}$	7.85			4.21							3.81					3.96
Ratio																
Mg#	55.7	58.6	59.1	54.6	54.9	51.8	56.1	52.7	57.2	53.6	55.9	60.6	57.5	56.7	59.9	58.5
Sr/Y	11.6	8.35	6.99	6.82	10.9	5.10	13.3	6.16	6.47	8.47	7.33	13.1	10.8	15.8	12.7	8.45
Nb/La	0.58	0.58	0.60	0.42	0.43	0.38	0.41	0.37	0.38	0.39	0.37	0.38	0.37	0.38	0.40	0.36
Nb/U	12.0	8.11	4.87	3.57	6.02	9.13	11.8	4.56	5.80	8.19	12.4	5.50	4.25	3.08	2.12	3.05

Table S3: Continuted

Location																
Sample	**YB37**	**YB38**	**E3**	**E4**	**E5**	**E7**	**E9**	**E11**	**E12**	**H1**	**H3**	**H4**	**H5**	**H6**	**T4**	**T5**
Rock type																
Reference																
Age(Ma)																
Major(wt.%)																
SiO_2	46.82	48.16	45.18	46.49	44.07	48.10	45.41	48.33	47.13	45.51	46.52	47.24	47.29	47.70	44.82	46.98
TiO_2	2.80	1.80	1.99	1.78	2.84	1.46	2.31	1.36	1.30	1.81	1.97	1.73	2.37	2.34	2.06	2.00
Al_2O_3	12.54	13.77	14.92	14.39	13.63	14.62	13.11	14.67	15.67	15.14	14.39	15.20	12.83	12.90	15.59	15.69
Fe2O3T	15.85	13.84	12.58	12.36	14.78	12.48	15.73	13.27	11.78	11.02	13.74	12.84	15.37	15.96	12.67	11.16
Fe_2O_3																
FeO																
MnO	0.23	0.22	0.14	0.18	0.21	0.17	0.25	0.23	0.19	0.16	0.21	0.20	0.22	0.24	0.20	0.17
MgO	4.99	6.01	6.61	6.92	7.20	7.24	6.29	6.58	6.49	5.71	6.86	7.12	5.02	5.68	7.36	6.52
CaO	11.40	9.77	12.02	11.56	11.29	7.97	11.49	10.00	12.79	15.72	11.15	10.00	10.62	9.62	10.05	12.22
Na_2O	2.42	3.10	3.01	3.04	2.70	2.86	3.00	3.98	1.84	2.22	2.16	2.70	2.56	3.20	2.68	1.69
K_2O	0.28	0.35	0.19	0.15	0.13	0.78	0.19	0.31	0.09	0.05	0.29	0.15	0.36	0.30	0.31	0.33
P_2O_5	0.40	0.28	0.24	0.24	0.31	0.19	0.27	0.16	0.13	0.17	0.22	0.18	0.28	0.26	0.20	0.22
LOI	1.92	2.62	3.01	2.83	2.79	3.41	1.68	0.87	2.39	2.33	2.49	2.21	1.87	1.78	4.05	2.67
TOL	99.64	99.94	99.89	99.93	99.96	99.28	99.73	99.75	99.80	99.83	100.00	99.58	98.80	99.98	99.99	99.66
Trace(ppm)																
Li																
Be																
Sc	44.1	40.7	41.3	35.4	36.2	39.0	48.7	41.4	39.8	34.6	41.5	35.5	43.4	45.1	36.6	35.9
V	415	383	415	355	443	354	547	374	331	343	377	347	487	490	339	311
Cr	112	93.0	213	201	141	161	134	69.0	175	97.0	169	150	60.0	80.0	173	93.0
Co	37.7	37.5	50.4	49.9	67.2	52.8	50.9	52.1	59.7	60.7	50.9	55.0	57.5	60.5	53.0	58.9
Ni	35.9	30.4	77.2	70.9	76.6	67.1	53.4	43.5	58.2	81.2	60.4	70.1	45.9	45.2	87.3	68.1
Cu	69.2	79.6	73.5	61.9	57.9	3.10	53.6	71.4	67.8	81.6	77.6	90.3	72.6	73.0	63.5	68.3
Zn	119	114	96.0	114	142	131	152	137	105	110	123	144	152	146	100	121

Table S3: Continuted

Location																
Sample	**YB37**	**YB38**	**E3**	**E4**	**E5**	**E7**	**E9**	**E11**	**E12**	**H1**	**H3**	**H4**	**H5**	**H6**	**T4**	**T5**
Rock type																
Reference																
Age(Ma)																
Ga																
Ge																
Rb	1.93	4.10	2.74	2.32	2.31	18.4	2.85	4.51	2.20	2.10	3.82	2.93	14.1	4.83	5.53	5.52
Sr	246	333	421	299	406	293	194	283	322	842	221	267	259	233	268	375
Y	33.4	33.4	38.6	34.1	41.5	33.1	48.6	34.1	29.0	26.6	38.8	32.5	54.2	54.7	29.1	25.2
Zr	94.0	97.0	111	117	169	88.0	113	100	66.0	143	122	82.0	166	154	131	149
Nb	3.02	2.82	3.34	3.83	3.93	2.71	2.54	2.65	2.65	4.35	3.32	2.32	4.74	4.31	4.95	6.29
Sn																
Cs	0.11	0.24	0.09	0.09	0.15	0.19	0.11	0.20	0.09	0.11	0.19	0.20	2.56	0.39	0.15	0.19
Ba	111	162	85.8	68.0	57.6	508	62.9	228	30.8	12.3	131	70.0	196	169	118	35.9
La	8.00	8.09	8.05	8.11	7.59	7.56	7.25	9.37	5.82	6.80	7.93	5.87	11.8	10.7	7.31	8.89
Ce	20.5	21.2	22.4	22.0	23.2	20.1	20.5	23.5	14.1	21.5	20.6	15.4	28.6	28.1	19.7	24.8
Pr	3.14	3.18	3.05	3.05	3.43	2.69	3.26	3.35	2.14	3.10	2.92	2.35	4.23	3.99	3.13	3.41
Nd	16.0	16.1	15.9	16.4	18.7	14.5	18.6	15.3	11.3	15.2	16.5	12.7	21.2	20.5	16.3	17.0
Sm	4.83	4.83	5.19	4.77	5.84	4.50	5.65	4.38	3.45	4.65	5.00	3.96	6.83	6.19	4.74	4.72
Eu	1.73	1.71	1.83	1.88	2.38	1.55	2.26	1.53	1.30	1.72	1.85	1.41	2.32	2.19	1.77	1.75
Gd	5.92	5.95	6.64	6.30	7.16	5.29	7.26	5.32	4.20	5.21	5.96	4.94	7.93	7.35	5.09	5.01
Tb	0.98	1.00	0.95	0.99	1.25	0.77	1.17	0.80	0.66	0.73	0.89	0.74	1.25	1.21	0.78	0.75
Dy	6.33	6.30	7.07	6.62	7.69	5.79	8.39	6.44	4.53	5.02	6.82	5.39	8.87	8.95	5.59	4.97
Ho	1.28	1.30	1.44	1.30	1.52	1.15	1.77	1.25	0.93	0.98	1.50	1.08	1.91	1.74	1.05	0.93
Er	3.88	3.89	3.83	3.38	4.07	3.22	4.91	3.67	2.89	2.69	4.17	3.10	5.14	5.23	3.00	2.64
Tm	0.53	0.54	0.57	0.54	0.61	0.48	0.79	0.49	0.40	0.38	0.60	0.46	0.79	0.74	0.44	0.38
Yb	3.53	3.53	3.95	3.18	3.80	2.83	4.92	3.42	2.60	2.38	3.72	3.07	4.96	4.35	2.57	2.40
Lu	0.53	0.52	0.58	0.50	0.57	0.43	0.72	0.54	0.39	0.38	0.54	0.45	0.76	0.70	0.42	0.34
Hf	2.83	2.84	3.33	3.07	4.37	2.57	3.40	2.74	2.11	3.59	3.37	2.43	4.66	4.71	3.45	3.93
Ta	0.22	0.21	0.24	0.24	0.29	0.20	0.19	0.17	0.16	0.32	0.22	0.14	0.28	0.29	0.35	0.44

Table S3: Continuted

Location																
Sample	**YB37**	**YB38**	**E3**	**E4**	**E5**	**E7**	**E9**	**E11**	**E12**	**H1**	**H3**	**H4**	**H5**	**H6**	**T4**	**T5**
Rock type																
Reference																
Age(Ma)																
Pb	2.37	1.76	0.64	1.91	2.23	5.68	1.64	12.6	11.0	1.32	1.56	1.29	3.72	2.38	1.19	1.20
Th	0.65	0.55	0.29	0.33	0.27	0.99	0.55	1.47	0.56	0.24	0.53	0.28	0.83	0.83	0.28	0.34
U	0.72	0.47	0.11	0.14	0.11	0.28	0.18	0.51	0.17	0.12	0.15	0.11	0.22	0.19	0.11	0.17
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)																
$\varepsilon_{Nd\ (t)}$																
Ratio																
Mg#	42.3	50.3	55.0	56.6	53.2	57.5	48.2	53.6	56.2	54.7	53.8	56.4	43.2	45.3	57.5	57.7
Sr/Y	7.37	9.97	10.9	8.77	9.78	8.85	3.99	8.30	11.1	31.7	5.70	8.22	4.78	4.26	9.21	14.9
Nb/La	0.38	0.35	0.41	0.47	0.52	0.36	0.35	0.28	0.46	0.64	0.42	0.40	0.40	0.40	0.68	0.71
Nb/U	4.19	6.00	30.4	27.4	35.7	9.68	14.1	5.20	15.6	36.3	22.1	21.1	21.5	22.7	45.0	37.0

Table S3: Continuted

Location																
Sample	**T6**	**YB12-4**	**YB16-1**	**YB16-3**	**YB18**	**YB21-2**	**YB21-6**	**YB22**	**YB27**	**YB30**	**YB41**	**YB43**	**LQW3**	**LQW5**	**LQWS8**	**LQWI0**
Rock type		**Sub alkaline mafic rock**														
Reference		**Li et al., 2006**														
Age(Ma)													**805**			
Major(wt.%)																
SiO_2	44.99	50.51	54.03	52.32	47.21	49.65	46.98	48.41	46.96	46.07	47.22	45.76	47.47	47.36	47.90	49.73
TiO_2	1.89	0.56	0.53	0.58	1.95	1.80	1.43	2.66	2.11	1.91	2.02	2.31	2.00	2.05	2.32	1.94
Al_2O_3	16.04	14.56	18.18	17.83	14.77	15.09	17.32	13.30	16.44	16.72	16.39	16.53	15.55	15.26	14.88	15.14
Fe2O3T	11.56	10.05	9.73	10.68	13.86	11.62	11.20	14.26	12.33	12.19	13.88	13.10	13.46	13.46	13.83	11.87
Fe_2O_3																
FeO																
MnO	0.17	0.20	0.15	0.13	0.20	0.19	0.17	0.23	0.19	0.19	0.17	0.21	0.20	0.19	0.19	0.17
MgO	6.67	10.75	4.19	5.44	7.87	6.33	9.19	7.34	8.31	8.18	5.85	7.31	7.17	7.41	6.64	6.81
CaO	12.24	8.52	7.65	7.91	10.78	11.12	10.68	10.35	10.65	12.11	13.10	11.36	9.36	8.66	8.07	9.27
Na_2O	1.62	4.01	3.39	3.48	2.90	3.73	2.35	3.33	2.83	2.44	1.43	2.45	2.18	2.37	2.33	1.99
K_2O	0.60	0.33	1.47	1.18	0.21	0.44	0.21	0.21	0.21	0.28	0.09	0.38	0.56	0.59	1.03	0.75
P_2O_5	0.20	0.10	0.18	0.12	0.21	0.22	0.13	0.22	0.22	0.18	0.17	0.24	0.18	0.18	0.31	0.32
LOI	2.98	3.47	2.89	3.41	1.14	4.52	4.77	3.11	3.66	3.58	4.47	4.04	1.35	1.84	1.89	1.45
TOL	98.95	99.97	99.51	99.67	99.97	100.19	99.65	100.31	100.25	100.25	100.33	99.64	99.46	99.35	99.40	99.44
Trace(ppm)																
Li																
Be																
Sc	35.9												42.6	43.2	42.8	36.6
V	330	212	165	222	341	321	241	452	313	292	330	348	312	306	349	244
Cr	59.0	686	30.6	83.9	237	201	137	189	124	101	154	132	168	179	137	221
Co	64.3												40.6	38.0	38.6	36.8
Ni	74.3	118	18.0	33.4	91.7	67.8	150	32.0	85.1	75.6	72.3	68.2	44.5	42.0	40.0	74.2
Cu	72.0															
Zn	102															

Table S3: Continuted

Location															
Sample	**T6**	**YB12-4**	**YB16-1**	**YB16-3**	**YB18**	**YB21-2**	**YB21-6**	**YB22**	**YB27**	**YB30**	**YB41**	**YB43**	**LQW3**	**LQW5**	**LQWS8**	**LQWI0**
Rock type		**Sub alkaline mafic rock**													
Reference		**Li et al., 2006**													
Age(Ma)													**805**			
Ga		15.2	21.1	20.6	19.1	18.0	17.8	20.9	19.8	19.7	19.9	21.3				
Ge																
Rb	15.1	4.22	27.7	22.7	2.62	5.22	3.71	1.81	2.61	2.84	0.55	4.43	28.3	20.4	46.4	28.8
Sr	413	491	1050	971	205	342	317	186	346	471	448	373	194	181	179	228
Y	27.0	10.1	13.6	12.4	37.0	33.8	24.0	43.6	28.4	27.3	35.0	31.7	45.7	44.2	49.7	46.0
Zr	155	78.4	118	86.8	114	105	89.0	162	155	123	123	166	137	141	220	187
Nb	6.53	2.62	3.81	2.20	2.96	2.90	2.14	4.13	5.52	4.09	3.74	5.57	4.55	4.42	8.74	10.8
Sn																
Cs	0.30												8.63	3.14	9.74	7.55
Ba	39.6	179	704	423	60.4	140	47.0	109	40.7	25.7	25.3	50.2	180	269	442	479
La	8.85	12.9	22.1	14.2	6.13	7.00	3.16	7.15	8.21	6.37	5.19	8.77	8.48	8.36	17.4	21.3
Ce	25.4	28.6	48.2	30.7	17.8	18.9	10.5	21.8	23.3	19.0	15.9	25.4	20.6	20.6	40.2	45.6
Pr	3.31	4.10	6.66	4.38	3.14	3.17	1.99	3.82	3.83	3.27	2.88	4.24	2.96	3.08	5.36	5.52
Nd	16.0	17.7	28.0	18.7	16.0	15.7	10.5	19.6	18.5	15.9	14.9	20.2	15.1	15.4	24.8	24.8
Sm	4.70	3.49	4.92	3.58	4.71	4.39	3.08	5.64	4.75	4.25	4.51	5.17	4.57	4.76	6.48	5.98
Eu	1.65	1.03	1.64	1.15	1.65	1.63	1.19	2.01	1.67	1.60	1.61	1.85	1.84	1.86	2.10	1.79
Gd	5.18	2.61	3.57	2.83	5.68	5.23	3.85	6.80	5.11	4.77	5.36	5.64	5.80	6.08	7.35	6.69
Tb	0.71	0.36	0.49	0.41	0.99	0.90	0.67	1.17	0.86	0.79	0.94	0.95	1.07	1.10	1.28	1.14
Dy	5.12	1.86	2.46	2.24	6.19	5.55	4.11	7.21	5.02	4.73	5.90	5.56	6.82	7.05	7.87	6.92
Ho	0.98	0.35	0.46	0.44	1.27	1.16	0.85	1.48	1.01	0.96	1.23	1.11	1.46	1.50	1.67	1.43
Er	2.73	0.91	1.22	1.17	3.47	3.08	2.24	4.00	2.64	2.56	3.24	2.97	4.23	4.41	4.91	4.32
Tm	0.38	0.13	0.17	0.17	0.53	0.46	0.33	0.59	0.39	0.38	0.49	0.43	0.60	0.61	0.69	0.59
Yb	2.18	0.75	1.08	1.03	3.19	2.67	1.92	3.54	2.35	2.30	3.00	2.61	3.95	4.02	4.46	3.90
Lu	0.36	0.12	0.18	0.17	0.50	0.37	0.27	0.54	0.37	0.36	0.46	0.41	0.58	0.59	0.65	0.56
Hf	3.49	2.15	3.02	2.26	3.20	2.87	2.44	4.24	3.78	3.25	3.29	4.18	3.40	3.64	4.93	4.41
Ta	0.46	0.15	0.22	0.13	0.21	0.19	0.13	0.25	0.37	0.29	0.22	0.39	0.39	0.33	0.65	0.78

Table S3: Continuted

Location																
Sample	**T6**	**YB12-4**	**YB16-1**	**YB16-3**	**YB18**	**YB21-2**	**YB21-6**	**YB22**	**YB27**	**YB30**	**YB41**	**YB43**	**LQW3**	**LQW5**	**LQWS8**	**LQWI0**
Rock type		**Sub alkaline mafic rock**														
Reference		**Li et al., 2006**														
Age(Ma)													**805**			
Pb	1.14	5.99	6.31	5.12	1.36	2.04	2.68	1.97	1.21	1.05	2.76	1.82	12.8	12.8	9.56	17.0
Th	0.37	2.28	2.41	2.99	0.25	0.35	0.12	0.25	0.31	0.22	0.18	0.32	0.54	0.58	1.77	2.69
U	0.17	0.45	0.55	0.66	0.08	0.15	0.03	0.11	0.15	0.11	0.09	0.15	0.15	0.24	0.33	0.37
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)													0.704130			0.707765
$\varepsilon_{Nd\ (t)}$		1.70	3.40	4.50	7.30	5.70	10.70	9.40	8.40	8.80	8.9	8.2	2.63			-2.50
Ratio																
Mg#	57.4	71.4	50.1	54.3	57.0	55.9	65.7	54.5	61.1	61.0	49.6	56.5	55.4	56.2	52.8	57.2
Sr/Y	15.3	48.6	77.0	78.3	5.54	10.1	13.2	4.27	12.2	17.3	12.8	11.8	4.25	4.09	3.60	4.96
Nb/La	0.74	0.20	0.17	0.15	0.48	0.41	0.68	0.58	0.67	0.64	0.72	0.64	0.54	0.53	0.50	0.51
Nb/U	38.4	5.82	6.93	3.33	37.0	19.3	71.3	37.5	36.8	37.2	41.6	37.1	30.3	18.4	26.5	29.2

Table S3: Continuted

Location	Dengxiangying dike															
Sample	LQWI12	LQWI15	LQWI17	LQW19	LQW20	LQW22	LQW24	LQW25	LQW27	LQW28	LQW29	XF-06	TJ-01	TJ-03	TJ-04	TJ-05
Rock type	Sub alkaline mafic rock															
Reference	Li and Zhao, 2018															
Age(Ma)																
Major(wt.%)																
SiO_2	46.98	46.66	52.29	52.61	47.12	39.47	54.00	47.99	44.83	43.72	42.20	43.76	45.95	44.61	46.27	43.21
TiO_2	3.16	2.05	1.92	1.71	1.98	3.40	1.65	2.80	1.71	2.24	2.31	2.92	2.08	2.23	2.20	1.57
Al_2O_3	14.58	15.42	13.08	15.36	15.09	15.45	14.07	16.97	15.96	17.55	15.92	14.21	14.81	15.57	15.30	16.55
Fe2O3T	15.35	12.60	10.32	10.67	13.09	20.14	14.53	18.09	12.06	19.65	14.67	14.88	11.74	12.29	11.60	11.31
Fe_2O_3																
FeO																
MnO	0.21	0.09	0.12	0.15	0.18	0.22	0.15	0.08	0.17	0.17	0.24	0.20	0.18	0.18	0.17	0.16
MgO	6.22	9.70	12.48	5.04	7.81	10.59	8.52	5.67	5.47	7.36	5.91	6.97	6.98	7.27	7.06	9.48
CaO	5.32	4.86	3.03	7.52	7.51	2.51	0.44	0.43	6.92	0.88	7.03	10.35	10.32	9.47	9.18	9.48
Na_2O	2.89	2.28	0.49	2.35	1.72	0.02	0.03	0.19	0.88	0.21	1.44	1.89	3.28	3.25	3.49	2.66
K_2O	1.34	1.01	0.89	1.95	1.58	0.02	0.87	1.54	1.81	0.94	0.64	0.12	0.38	0.38	0.42	0.15
P_2O_5	0.31	0.18	0.28	0.20	0.20	0.39	0.16	0.25	0.25	0.24	0.22	0.36	0.20	0.22	0.22	0.16
LOI	3.46	5.11	5.02	1.89	2.96	7.15	5.70	5.26	9.54	6.63	9.37	3.57	3.17	3.36	3.12	4.41
TOL	99.81	99.96	99.91	99.45	99.24	99.36	100.11	99.25	99.61	99.59	99.96	99.23	99.09	98.83	99.03	99.14
Trace(ppm)																
Li																
Be																
Sc	45.6	44.1	27.4	38.3	40.1	45.5	35.3	46.6	39.1	46.8	44.8	42.0	37.1	38.6	37.8	28.4
V	396	291	215	293	295	365	260	384	294	303	305	444	351	371	361	267
Cr	88.6	211	281	38.9	152	144	117	150	157	280	228	291	170	134	137	133
Co	43.0	44.1	32.5	32.6	34.4	51.3	47.8	56.2	43.5	59.8	53.6	51.1	44.6	47.8	45.0	54.5
Ni	31.9	31.2	58.0	16.1	41.3	48.4	36.2	34.7	46.0	43.7	31.0	63.5	61.9	47.2	47.0	118
Cu												58.2	65.4	64.4	61.3	51.5
Zn												131	92.6	99.9	92.2	77.1

Table S3: Continuted

Location	Dengxiangying dike															
Sample	LQWI12	LQWI15	LQWI17	LQW19	LQW20	LQW22	LQW24	LQW25	LQW27	LQW28	LQW29	XF-06	TJ-01	TJ-03	TJ-04	TJ-05
Rock type	Sub alkaline mafic rock															
Reference	Li and Zhao, 2018															
Age(Ma)																
Ga												21.1	19.0	20.2	18.0	15.8
Ge																
Rb	38.7	45.1	36.6	113	88.7	2.65	56.2	76.0	95.4	44.3	31.4	1.13	3.99	4.20	4.50	1.81
Sr	208	126	48.1	201	162	15.5	9.47	31.3	160	34.6	151	367	412	389	378	347
Y	53.7	37.8	33.1	38.5	40.7	70.0	34.3	29.9	41.0	26.4	41.1	45.7	27.3	29.3	29.4	18.3
Zr	249	139	174	220	145	260	130	184	122	145	155	207	136	151	147	94.5
Nb	10.2	3.69	8.90	10.6	7.92	13.6	3.77	5.75	4.72	4.43	4.44	4.34	3.70	4.34	4.11	3.06
Sn																
Cs	3.33	12.4	4.74	26.4	33.0	0.43	3.64	7.64	8.30	3.33	2.92	0.12	0.07	0.08	0.07	0.12
Ba	815	453	785	548	460	22.7	107	158	174	119	76.3	58.4	196	118	153	34.4
La	21.4	7.07	16.3	25.2	8.69	22.6	14.9	5.71	6.46	4.61	9.62	8.24	6.32	7.17	6.87	5.02
Ce	48.9	17.8	38.1	55.9	21.0	56.7	36.3	15.5	16.0	11.5	23.9	24.9	18.4	19.8	19.5	13.8
Pr	6.06	2.60	4.72	6.75	3.01	6.90	4.75	2.05	2.20	1.52	3.25	4.08	2.94	3.26	3.10	2.28
Nd	27.8	13.3	21.5	28.5	15.3	32.3	21.1	10.3	11.6	7.95	16.3	23.0	15.7	18.0	17.5	12.0
Sm	7.14	3.97	5.12	6.17	4.63	8.24	4.85	3.20	3.70	2.78	4.80	7.16	4.55	5.13	5.18	3.26
Eu	2.16	1.55	1.21	1.74	1.69	1.99	1.27	1.03	1.23	0.72	1.52	2.19	1.55	1.61	1.51	1.16
Gd	8.13	5.03	5.70	6.52	5.74	9.41	4.76	4.05	5.10	3.83	5.69	7.58	5.02	5.40	5.18	3.63
Tb	1.37	0.92	0.91	1.09	1.02	1.75	0.89	0.72	0.91	0.70	1.01	1.24	0.83	0.88	0.85	0.56
Dy	8.28	6.11	5.30	6.24	6.54	11.5	5.68	4.70	6.05	4.57	6.51	8.31	5.30	5.72	5.72	3.66
Ho	1.69	1.28	1.09	1.27	1.38	2.43	1.19	1.04	1.30	0.93	1.35	1.73	1.06	1.15	1.12	0.70
Er	5.01	3.87	3.16	3.78	4.10	7.15	3.62	3.21	3.88	2.71	4.00	4.98	2.88	3.16	3.19	2.01
Tm	0.69	0.55	0.43	0.51	0.58	1.01	0.53	0.51	0.56	0.40	0.57	0.75	0.42	0.45	0.44	0.28
Yb	4.50	3.59	2.87	3.37	3.87	6.32	3.57	3.47	3.68	2.72	3.83	4.68	2.57	2.88	2.96	1.77
Lu	0.66	0.53	0.42	0.50	0.58	0.90	0.57	0.55	0.54	0.42	0.57	0.67	0.38	0.42	0.41	0.27
Hf	5.85	3.40	4.11	5.39	3.71	6.09	3.36	4.57	3.09	3.67	4.01	4.80	3.20	3.50	3.57	2.19
Ta	0.78	0.28	0.66	0.82	0.63	1.04	0.30	0.44	0.37	0.36	0.34	0.28	0.21	0.25	0.24	0.18

Table S3: Continuted

Location	Dengxiangying dike															
Sample	**LQWI12**	**LQWI15**	**LQWI17**	**LQW19**	**LQW20**	**LQW22**	**LQW24**	**LQW25**	**LQW27**	**LQW28**	**LQW29**	**XF-06**	**TJ-01**	**TJ-03**	**TJ-04**	**TJ-05**
Rock type	Sub alkaline mafic rock															
Reference	Li and Zhao, 2018															
Age(Ma)																
Pb	82.1	17.6	12.3	11.9	22.8	227	18.5	13.5	21.2	58.7	637	2.11	1.22	0.83	0.93	1.33
Th	3.47	0.52	3.05	6.52	0.66	2.54	0.84	0.76	0.89	0.84	0.78	0.37	0.26	0.29	0.28	0.18
U	0.34	0.09	0.41	0.70	0.20	0.38	0.27	0.15	0.25	0.96	0.69	0.15	0.11	0.13	0.14	0.09
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)			0.704015			0.730039					0.721586					
$\varepsilon_{Nd\ (t)}$			-1.90			-1.00					1.90				7.14	7.24
Ratio																
Mg#	48.6	64.2	73.8	52.4	58.2	55.1	57.7	42.2	51.4	46.6	48.4	52.2	58.1	58.0	58.7	66.1
Sr/Y	3.87	3.33	1.45	5.22	3.97	0.22	0.28	1.05	3.90	1.31	3.67	8.03	15.1	13.3	12.9	19.0
Nb/La	0.48	0.52	0.55	0.42	0.91	0.60	0.25	1.01	0.73	0.96	0.46	0.53	0.59	0.61	0.60	0.61
Nb/U	30.0	41.0	21.7	15.1	39.6	35.8	14.0	38.3	18.9	4.61	6.43	28.9	33.6	33.4	29.4	34.0

Table S3: Continuted

Location	Yanbian dike															
Sample	**TJ-07**	**DW-02**	**HL-01**	**HL-03**	**HL-04**	**HS-08**	**HT-06**	**HT-07**	**HS-06**	**HS-07**	**04HS-01**	**04HS-04**	**04HS-05**	**04HS-06**	**04HS-07**	**04HS-08**
Rock type	Sub alkaline mafic rock															
Reference	Zhu et al., 2008															
Age(Ma)	761															
Major(wt.%)																
SiO_2	44.62	45.43	44.87	45.04	44.64	47.08	46.10	46.67	46.38	47.16	47.85	46.81	48.40	48.21	48.63	46.65
TiO_2	2.24	1.65	1.96	2.19	1.95	1.63	2.30	2.34	2.13	1.95	1.66	2.16	1.69	1.30	1.42	1.51
Al_2O_3	15.92	16.08	15.97	15.23	15.96	15.51	13.05	13.10	14.17	13.89	14.31	14.42	13.49	14.92	14.88	15.14
Fe2O3T	12.37	11.27	12.29	12.43	12.04	12.13	15.20	15.30	14.17	12.71	12.85	14.32	12.80	11.73	11.87	11.86
Fe_2O_3																
FeO																
MnO	0.18	0.16	0.18	0.18	0.19	0.18	0.25	0.22	0.24	0.19	0.21	0.24	0.19	0.20	0.18	0.19
MgO	7.24	6.67	7.97	7.23	7.44	7.53	5.32	5.14	6.30	6.85	7.36	6.50	7.75	8.69	7.33	7.25
CaO	8.88	8.87	8.18	10.85	9.68	10.21	10.80	10.32	10.76	11.27	10.56	9.99	11.09	8.41	8.82	11.11
Na_2O	3.37	2.58	3.41	2.89	3.03	2.55	2.64	2.73	2.87	2.41	2.41	2.98	1.93	3.03	3.30	2.13
K_2O	0.41	0.59	0.25	0.53	0.64	0.32	0.25	0.35	0.12	0.28	0.33	0.16	0.17	0.56	0.19	0.18
P_2O_5	0.22	0.20	0.20	0.26	0.20	0.19	0.29	0.30	0.24	0.23	0.19	0.27	0.17	0.14	0.17	0.17
LOI	3.35	6.55	3.74	3.01	3.60	3.12	2.54	2.65	3.28	2.71	2.63	3.00	2.94	3.29	2.90	2.96
TOL	98.80	100.05	99.02	99.84	99.37	100.45	98.74	99.12	100.66	99.65	100.36	100.85	100.62	100.48	99.69	99.15
Trace(ppm)																
Li																
Be																
Sc	38.4	40.5	32.8	36.3	33.5	40.6	42.7	43.3	47.5	47.9	50.3	49.3	51.7	44.4	35.4	36.6
V	359	354	334	384	342	341	466	473	428	424	353	433	412	268	301	288
Cr	139	351	152	164	164	267	84.7	81.5	252	189	203	238	240	282	170	197
Co	48.6	46.7	56.5	54.5	53.0	38.7	49.8	48.5	51.3	48.2	46.2	51.5	49.6	42.0	40.6	41.4
Ni	47.8	87.3	85.8	59.6	81.4	113	33.3	33.9	80.7	70.3	75.5	72.7	65.0	90.9	64.5	73.8
Cu	61.8	73.3	73.1	82.7	45.4	75.7	73.2	75.3	89.1	56.5	75.5	95.8	68.5	85.3	31.7	77.8
Zn	96.9	97.6	118	90.5	85.9	104	133	135	129	99.4	104	127	88.6	74.6	64.2	83.7

Table S3: Continuted

Location	Yanbian dike															
Sample	TJ-07	DW-02	HL-01	HL-03	HL-04	HS-08	HT-06	HT-07	HS-06	HS-07	04HS-01	04HS-04	04HS-05	04HS-06	04HS-07	04HS-08
Rock type	Sub alkaline mafic rock															
Reference	Zhu et al., 2008															
Age(Ma)											761					
Ga	19.0	17.6	16.3	18.9	17.7	17.8	20.0	20.6	21.0	18.6	17.5	20.5	17.4	15.3	16.9	18.3
Ge																
Rb	4.32	8.99	3.33	7.54	10.4	4.51	6.80	11.3	1.16	3.06	6.02	2.15	2.11	7.39	1.94	2.14
Sr	391	248	175	329	337	292	305	279	467	249	220	437	271	187	226	284
Y	28.8	29.0	25.6	31.3	25.4	28.8	46.3	47.8	41.1	37.4	31.3	42.3	30.6	25.0	24.9	25.6
Zr	150	91.8	136	166	129	88.4	157	157	146	127	97.9	149	96.2	74.7	73.2	79.9
Nb	4.25	2.25	4.34	5.02	4.36	2.06	4.07	4.04	3.44	2.97	2.43	3.23	2.12	1.70	1.68	1.78
Sn																
Cs	0.10	0.52	0.35	0.34	0.41	0.21	1.51	2.55	0.22	0.20	0.71	0.33	0.16	0.14	0.13	0.09
Ba	85.8	254	131	113	145	144	175	241	57.7	127	143	83.1	70.5	148	92.8	59.4
La	7.31	5.52	6.78	8.06	6.40	5.76	10.7	10.8	9.63	8.08	7.00	9.54	6.03	5.19	5.79	5.88
Ce	20.5	14.7	19.0	23.0	18.2	15.3	26.6	26.6	24.0	20.9	17.6	24.2	15.1	13.2	14.7	14.6
Pr	3.39	2.33	3.04	3.86	2.96	2.41	4.12	4.14	3.77	3.19	2.70	3.72	2.48	2.16	2.35	2.41
Nd	17.7	12.5	16.7	20.2	16.1	12.9	21.6	22.2	19.4	16.7	14.1	18.6	12.5	11.1	12.0	12.3
Sm	4.91	4.32	4.66	5.55	4.33	3.79	6.26	6.48	5.30	4.93	4.10	5.70	3.76	3.37	3.41	3.46
Eu	1.60	1.42	1.40	1.57	1.39	1.46	1.93	1.88	1.91	1.69	1.56	1.85	1.48	1.22	1.24	1.36
Gd	5.26	4.49	4.64	5.47	4.53	4.47	7.11	7.26	6.68	5.81	4.93	6.11	4.67	4.20	4.24	4.35
Tb	0.87	0.77	0.78	0.94	0.75	0.76	1.20	1.24	1.18	0.97	0.86	1.10	0.83	0.77	0.74	0.77
Dy	5.77	5.40	5.27	6.00	5.25	5.12	8.44	8.71	7.59	6.77	5.74	7.66	5.32	5.05	4.91	5.07
Ho	1.13	1.13	1.01	1.23	1.01	1.05	1.79	1.80	1.59	1.46	1.15	1.63	1.12	1.01	0.99	1.09
Er	3.47	3.28	2.99	3.57	3.00	3.02	5.21	5.27	4.64	4.12	3.26	4.67	3.22	2.98	2.95	3.00
Tm	0.48	0.48	0.43	0.48	0.43	0.44	0.76	0.76	0.69	0.61	0.47	0.68	0.45	0.43	0.41	0.43
Yb	2.86	3.08	2.76	3.37	2.76	2.73	4.94	4.90	4.32	3.80	3.04	4.33	2.92	2.84	2.75	2.88
Lu	0.42	0.48	0.40	0.51	0.39	0.40	0.73	0.74	0.66	0.53	0.45	0.60	0.43	0.42	0.39	0.42
Hf	3.50	2.30	2.95	3.67	2.90	2.35	3.91	4.05	3.74	3.23	2.62	4.10	2.63	2.18	2.08	2.18
Ta	0.25	0.13	0.26	0.30	0.26	0.12	0.21	0.22	0.23	0.19	0.16	0.21	0.14	0.12	0.11	0.12

Table S3: Continuted

Location	Yanbian dike															
Sample	**TJ-07**	**DW-02**	**HL-01**	**HL-03**	**HL-04**	**HS-08**	**HT-06**	**HT-07**	**HS-06**	**HS-07**	**04HS-01**	**04HS-04**	**04HS-05**	**04HS-06**	**04HS-07**	**04HS-08**
Rock type	**Sub alkaline mafic rock**															
Reference	**Zhu et al., 2008**															
Age(Ma)											**761**					
Pb	1.05	2.51	1.28	1.12	1.22	2.18	2.82	2.71	4.42	1.51	5.41	5.09	4.36	1.06	1.14	1.80
Th	0.31	0.19	0.32	0.40	0.29	0.17	0.87	0.88	0.67	0.63	0.47	0.71	0.45	0.39	0.38	0.39
U	0.13	0.07	0.14	0.15	0.15	0.07	0.21	0.23	0.17	0.15	0.13	0.18	0.18	0.09	0.11	0.11
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)																
$\varepsilon_{Nd\ (t)}$				6.71		5.4	4.52		4.46		4.79			5.28		
Ratio																
Mg#	57.7	58.0	60.2	57.5	59.0	59.1	44.9	43.9	50.9	55.7	57.2	51.4	58.5	63.3	59.0	58.8
Sr/Y	13.6	8.55	6.84	10.5	13.3	10.1	6.59	5.84	11.4	6.66	7.03	10.3	8.86	7.48	9.08	11.1
Nb/La	0.58	0.41	0.64	0.62	0.68	0.36	0.38	0.37	0.36	0.37	0.35	0.34	0.35	0.33	0.29	0.30
Nb/U	32.7	32.1	31.0	33.5	29.1	29.4	19.4	17.6	20.2	19.8	18.7	17.9	11.8	18.9	15.3	16.2

Table S3: Continuted

Location			Tongde dike													
Sample	**04HS-10**	**04HS-11**	**TDM1**	**TDM3**	**TDM5**	**TDM7**	**TDM10**	**TDM12**	**TDM14**	**TDM16**	**TDM17**	**TDM18**	**TDM19**	**TDM20**	**TDM23**	**TDM25**
Rock type			Sub alkaline mafic rock													
Reference			Li and Zhao, 2018													
Age(Ma)							833									
Major(wt.%)																
SiO_2	47.20	46.60	50.19	59.90	53.45	49.81	56.48	56.55	49.84	50.35	57.04	57.95	57.22	54.21	55.81	54.91
TiO_2	1.55	1.51	0.62	0.76	0.71	1.12	0.74	0.87	0.99	0.97	1.00	1.00	1.00	0.68	0.71	0.67
Al_2O_3	15.47	15.02	13.81	18.32	17.24	11.82	17.27	16.43	18.51	18.82	17.45	16.85	17.24	18.14	17.88	17.19
Fe2O3T	12.89	12.64	9.52	5.98	8.58	12.46	6.09	6.60	9.68	9.41	7.12	6.53	6.55	7.15	6.96	6.30
Fe_2O_3																
FeO																
MnO	0.19	0.19	0.17	0.09	0.14	0.22	0.10	0.10	0.14	0.14	0.10	0.09	0.09	0.11	0.10	0.10
MgO	7.33	7.36	10.46	1.99	5.27	11.67	4.67	6.06	5.22	4.75	3.62	3.16	3.38	4.54	4.14	4.68
CaO	9.69	10.38	10.54	5.20	6.33	8.11	9.44	6.83	7.22	7.33	6.67	4.85	5.45	5.87	6.04	5.49
Na_2O	2.88	2.36	1.92	4.74	3.95	1.89	3.27	3.95	3.92	3.72	3.39	5.35	4.05	4.41	4.23	4.06
K_2O	0.29	0.47	0.53	0.88	1.54	0.53	0.48	0.14	0.91	0.93	0.52	1.09	1.70	1.25	1.59	1.95
P_2O_5	0.19	0.17	0.13	0.33	0.18	0.06	0.14	0.26	0.21	0.23	0.27	0.29	0.28	0.17	0.19	0.18
LOI	3.40	3.47	1.77	1.03	2.24	1.62	0.69	1.98	2.71	2.69	2.46	1.90	2.08	3.30	2.32	4.13
TOL	101.08	100.17	99.65	99.21	99.63	99.32	99.35	99.77	99.35	99.32	99.63	99.05	99.03	99.83	99.97	99.65
Trace(ppm)																
Li																
Be																
Sc	37.0	37.6	37.6	11.8	29.3	42.2	29.2	18.6	24.6	21.5	17.5	16.6	17.4	20.2	19.4	19.6
V	291	308	372	95.1	292	383	220	165	289	277	186	158	168	188	175	150
Cr	182	185	441	6.00	52.5	487	96.8	336	11.0	8.34	56.4	51.9	50.0	69.3	70.2	72.0
Co	46.1	43.6	35.1	11.2	30.0	43.6	21.6	25.1	30.0	24.6	18.7	18.2	18.4	25.3	22.8	22.0
Ni	68.3	66.8	103	4.39	24.7	145	34.6	156	15.4	11.8	12.2	9.86	10.0	46.1	40.4	42.5
Cu	73.7	93.5														
Zn	103	87.8														

Table S3: Continuted

Location			Tongde dike													
Sample	**04HS-10**	**04HS-11**	**TDM1**	**TDM3**	**TDM5**	**TDM7**	**TDM10**	**TDM12**	**TDM14**	**TDM16**	**TDM17**	**TDM18**	**TDM19**	**TDM20**	**TDM23**	**TDM25**
Rock type			Sub alkaline mafic rock													
Reference			Li and Zhao, 2018													
Age(Ma)							833									
Ga	17.3	17.7														
Ge																
Rb	3.06	8.13	5.76	12.8	33.4	6.14	4.20	1.13	17.4	17.2	9.79	23.5	33.1	35.2	37.1	40.6
Sr	353	315	411	978	675	384	665	959	827	773	860	864	846	834	879	787
Y	25.7	24.2	12.6	13.5	18.8	31.2	10.4	8.33	16.1	16.0	11.0	10.0	10.3	13.5	13.3	13.2
Zr	73.7	69.9	66.6	271	121	93.3	66.5	140	113	119	198	219	214	128	150	134
Nb	1.74	1.69	1.95	8.10	3.67	4.12	3.28	4.07	3.91	3.96	6.65	7.59	7.16	3.04	3.88	3.37
Sn																
Cs	0.19	0.29	0.16	0.68	1.67	0.28	0.16	0.12	0.50	0.41	0.55	0.65	0.52	0.63	0.50	0.48
Ba	88.5	118	651	570	612	596	481	139	556	440	426	603	1380	404	651	656
La	6.45	5.63	8.06	28.8	17.0	12.6	10.4	13.2	17.9	18.9	19.5	19.5	19.8	13.9	16.6	14.2
Ce	15.3	14.2	17.9	59.9	36.1	41.8	24.3	29.3	37.0	40.1	40.6	41.0	41.9	29.9	34.9	30.1
Pr	2.48	2.29	2.36	7.17	4.71	6.69	3.19	3.88	4.68	4.46	4.12	4.43	4.77	3.40	3.95	3.64
Nd	12.4	11.6	10.4	28.2	19.8	32.1	13.7	16.4	19.9	19.5	17.5	18.7	20.2	14.9	16.9	15.9
Sm	3.60	3.43	2.20	4.47	3.89	7.25	2.68	2.80	3.92	3.86	3.34	3.48	3.74	3.14	3.50	3.15
Eu	1.41	1.32	0.82	1.44	1.27	2.11	1.10	1.13	1.41	1.33	1.30	1.37	1.56	1.13	1.22	1.20
Gd	4.42	4.24	2.29	3.75	3.79	6.83	2.48	2.43	3.52	3.41	2.89	2.93	3.20	2.82	3.13	3.07
Tb	0.79	0.74	0.35	0.52	0.57	1.03	0.35	0.33	0.53	0.50	0.41	0.41	0.43	0.43	0.45	0.43
Dy	5.08	4.86	1.90	2.29	3.05	5.54	1.81	1.49	2.71	2.56	1.84	1.76	1.87	2.17	2.26	2.16
Ho	1.11	1.02	0.38	0.42	0.62	1.06	0.34	0.27	0.52	0.49	0.33	0.30	0.32	0.41	0.43	0.41
Er	3.05	2.82	1.17	1.33	1.83	3.02	1.00	0.80	1.56	1.46	0.94	0.85	0.91	1.22	1.24	1.20
Tm	0.45	0.41	0.16	0.15	0.25	0.40	0.12	0.10	0.20	0.19	0.11	0.10	0.11	0.16	0.16	0.15
Yb	2.87	2.70	1.11	1.04	1.65	2.59	0.83	0.67	1.33	1.27	0.78	0.66	0.72	1.03	1.05	0.98
Lu	0.42	0.39	0.16	0.15	0.24	0.37	0.12	0.10	0.19	0.19	0.11	0.090	0.10	0.15	0.15	0.15
Hf	2.15	2.07	1.44	5.37	2.65	2.47	1.29	2.98	2.51	2.55	3.99	4.48	4.46	2.65	3.22	2.82
Ta	0.12	0.11	0.16	0.50	0.31	0.22	0.30	0.25	0.36	0.27	3.30	0.45	0.40	0.24	0.25	0.30

Table S3: Continuted

Location			Tongde dike													
Sample	**04HS-10**	**04HS-11**	**TDM1**	**TDM3**	**TDM5**	**TDM7**	**TDM10**	**TDM12**	**TDM14**	**TDM16**	**TDM17**	**TDM18**	**TDM19**	**TDM20**	**TDM23**	**TDM25**
Rock type			Sub alkaline mafic rock													
Reference			Li and Zhao, 2018													
Age(Ma)							833									
Pb	4.35	0.92	2.76	10.4	4.57	3.61	4.51	6.29	5.29	4.65	7.55	4.96	6.21	6.89	8.79	12.3
Th	0.39	0.38	1.11	1.42	3.00	0.23	0.30	0.63	3.21	3.08	0.81	0.71	0.75	1.57	1.54	1.40
U	0.13	0.11	0.20	0.36	0.54	0.10	0.11	0.20	0.67	0.66	0.23	0.19	0.17	0.51	0.48	0.42
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)				0.705525			0.705283			0.705392	0.706320					
$\varepsilon_{Nd\ (t)}$		4.91		0.80			0.60			2.00	1.30					
Ratio																
Mg#	57.0	57.6	71.9	43.7	58.9	68.6	64.1	68.2	55.7	54.1	54.2	53.0	54.6	59.7	58.1	63.4
Sr/Y	13.7	13.0	32.6	72.4	35.9	12.3	63.9	115	51.4	48.3	78.2	86.4	82.1	61.8	66.1	59.6
Nb/La	0.27	0.30	0.24	0.28	0.22	0.33	0.32	0.31	0.22	0.21	0.34	0.39	0.36	0.22	0.23	0.24
Nb/U	13.4	15.4	9.75	22.5	6.80	41.2	29.8	20.4	5.84	6.00	28.9	39.9	42.1	5.96	8.08	8.02

Table S3: Continuted

Location			Datian dike													
Sample	TDM26	TDM27	HM1103	HM1104	11DT02	11DT03	DT1204	DT1205	11DT04	DT1408	DT1409	DT1410	DT1411	DT1412	DT1416	DT1417
Rock type			Sub alkaline mafic rock													
Reference			Yang et al., 2017													
Age(Ma)					809		794									
Major(wt.%)																
SiO_2	50.55	52.45	48.17	47.13	48.36	47.65	47.56	52.54	46.64	47.90	46.90	47.20	47.00	46.80	45.40	45.70
TiO_2	1.20	1.10	1.62	1.18	0.88	1.11	1.04	0.31	3.60	1.54	3.53	3.58	2.30	2.31	1.73	1.76
Al_2O_3	17.89	17.88	14.96	15.40	15.21	16.49	15.62	15.42	12.92	15.35	13.35	13.30	14.85	14.80	16.05	16.15
Fe2O3T	9.48	9.22	11.41	10.58	10.11	10.68	10.56	9.21	16.14	12.22	16.64	16.72	14.92	14.98	11.78	11.63
Fe_2O_3																
FeO																
MnO	0.19	0.14	0.19	0.16	0.16	0.16	0.18	0.15	0.27	0.21	0.27	0.28	0.24	0.23	0.21	0.21
MgO	5.42	4.71	7.86	8.97	8.29	8.12	9.52	7.06	5.03	7.32	5.14	5.13	6.47	6.59	8.77	8.42
CaO	7.73	8.04	9.11	9.57	12.20	11.30	10.53	10.65	8.68	9.68	8.68	8.64	8.81	8.55	7.93	7.81
Na_2O	3.03	3.43	2.46	2.09	2.10	2.18	2.27	2.79	2.38	2.26	2.67	2.57	1.86	2.23	2.53	2.61
K_2O	1.80	1.19	1.29	1.20	0.53	0.43	0.65	0.47	1.37	1.24	0.91	1.02	0.83	0.59	1.40	1.44
P_2O_5	0.28	0.33	0.25	0.16	0.07	0.10	0.12	0.02	0.45	0.23	0.47	0.46	0.30	0.30	0.17	0.16
LOI	1.71	1.12	1.96	2.89	1.43	1.13	1.64	0.65	1.49	1.57	1.14	1.00	2.34	2.41	4.16	3.99
TOL	99.28	99.62	99.26	99.31	99.35	99.35	99.69	99.27	98.97	99.52	99.70	99.90	99.92	99.79	100.13	99.88
Trace(ppm)																
Li																
Be																
Sc	26.3	23.2	27.6	27.9	44.6	35.5	34.9	33.9	48.3	51.4	65.3	58.5	33.9	54.5	50.5	52.0
V	283	240	178	192	271	226	240	205	249	231	254	237	205	226	240	245
Cr	35.6	21.5	326	517	502	373	881	270	97.0	360	125	99.0	256	275	444	402
Co	30.4	28.4	39.6	44.4	42.4	47.8	42.9	33.9	44.0	44.2	49.5	40.5	33.9	43.1	53.1	49.7
Ni	23.0	17.0	41.0	42.1	21.2	9.78	21.8	13.8	6.97	17.2	13.5	13.3	13.8	42.1	171	128
Cu			21.6	25.2	15.8	28.9	22.1	13.6	45.4	27.6	39.9	32.0	13.6	36.1	51.6	43.8
Zn			103	112	65.7	99.5	107	95.9	256	117	187	182	95.9	149	173	169

Table S3: Continuted

Location			Datian dike													
Sample	TDM26	TDM27	HM1103	HM1104	11DT02	11DT03	DT1204	DT1205	11DT04	DT1408	DT1409	DT1410	DT1411	DT1412	DT1416	DT1417
Rock type			Sub alkaline mafic rock													
Reference			Yang et al., 2017													
Age(Ma)					809		794									
Ga			15.6	15.3	14.3	14.8	15.8	17.7	23.5	18.3	24.6	23.9	17.7	21.0	19.3	19.7
Ge																
Rb	43.2	23.6	83.7	73.4	13.4	11.3	34.2	10.3	80.0	97.6	51.3	60.3	10.3	39.7	97.9	99.1
Sr	614	788	272	280	214	240	240	266	216	262	232	240	266	275	449	447
Y	29.2	21.5	25.8	22.0	16.7	12.6	20.3	35.0	57.1	34.9	57.1	57.6	35.0	43.2	33.8	34.8
Zr	106	122	126	92.4	54.3	36.0	58.2	108	213	134	228	241	108	154	116	116
Nb	5.12	4.65	8.18	5.78	3.74	2.62	2.46	4.41	13.9	7.56	12.9	13.0	4.41	7.46	4.16	3.91
Sn																
Cs	0.78	0.56	0.69	0.86	0.27	0.26	0.45	0.17	0.90	2.73	0.75	0.77	0.17	1.05	1.24	1.19
Ba	666	609	266	272	157	149	155	114	526	200	361	361	114	207	252	243
La	11.0	14.2	15.3	15.1	7.26	5.73	7.13	16.8	28.2	13.5	24.6	25.2	16.8	13.4	9.11	9.15
Ce	27.3	31.4	31.4	26.0	16.1	12.5	16.8	34.1	59.4	31.8	56.9	58.4	34.1	31.9	23.1	23.4
Pr	3.80	3.76	4.38	3.76	2.27	1.49	2.42	4.46	7.58	3.97	7.42	7.60	4.46	4.26	3.29	3.29
Nd	18.0	17.5	18.6	15.2	10.1	6.80	11.4	18.7	34.1	17.9	34.2	34.5	18.7	19.6	16.0	16.4
Sm	4.48	3.97	4.45	3.67	2.52	1.79	3.12	4.98	8.72	4.64	8.78	8.66	4.98	5.53	4.59	4.54
Eu	1.71	1.49	1.49	1.25	0.98	1.02	1.23	1.18	2.58	1.51	2.85	2.84	1.18	2.01	1.62	1.82
Gd	4.70	4.09	4.41	3.75	2.81	1.99	3.32	5.10	9.88	5.26	9.39	9.56	5.10	6.43	5.13	5.23
Tb	0.78	0.63	0.76	0.66	0.48	0.37	0.62	1.05	1.73	0.95	1.65	1.67	1.05	1.14	0.93	0.98
Dy	4.58	3.44	4.80	4.12	3.16	2.47	3.53	6.19	10.8	6.16	10.0	10.3	6.19	7.32	5.91	5.94
Ho	0.93	0.68	1.02	0.83	0.65	0.51	0.82	1.43	2.19	1.25	2.12	2.21	1.43	1.57	1.26	1.34
Er	2.75	2.01	2.66	2.19	1.70	1.32	2.21	3.84	5.89	3.56	5.92	6.29	3.84	4.52	3.49	3.74
Tm	0.38	0.27	0.38	0.31	0.24	0.17	0.31	0.56	0.84	0.55	0.88	0.80	0.56	0.68	0.50	0.54
Yb	2.60	1.79	2.46	2.09	1.54	1.20	2.00	3.66	5.26	3.29	5.51	5.54	3.66	4.09	3.21	3.29
Lu	0.38	0.27	0.37	0.30	0.23	0.18	0.31	0.54	0.79	0.51	0.80	0.83	0.54	0.60	0.49	0.51
Hf	2.36	2.64	3.24	2.79	1.60	1.15	1.96	3.46	6.40	3.21	5.60	6.03	3.46	4.10	3.07	2.93
Ta	0.54	0.29	0.47	0.38	0.21	0.18	0.15	0.35	0.66	0.37	0.70	0.72	0.35	0.41	0.23	0.20

Table S3: Continuted

Location			Datian dike													
Sample	**TDM26**	**TDM27**	**HM1103**	**HM1104**	**11DT02**	**11DT03**	**DT1204**	**DT1205**	**11DT04**	**DT1408**	**DT1409**	**DT1410**	**DT1411**	**DT1412**	**DT1416**	**DT1417**
Rock type			**Sub alkaline mafic rock**													
Reference			**Yang et al., 2017**													
Age(Ma)					**809**		**794**									
Pb	6.70	10.9	3.21	3.84	1.62	1.84	2.63	3.05	9.85	3.58	6.80	5.70	3.05	2.25	2.01	1.88
Th	0.92	1.30	2.59	1.90	0.62	0.55	0.66	1.35	1.92	0.84	1.82	1.88	1.35	0.89	0.68	0.65
U	0.48	0.58	0.64	0.54	0.12	0.26	0.18	0.49	0.49	0.65	0.75	0.46	0.49	0.16	0.14	0.12
Isotopic date																
$^{87}Sr/^{86}Sr$ (t)	0.704862															
$\varepsilon_{Nd\ (t)}$	0.70		-2.2		-3.3		1.1		-1.2	-2.4	-1.1			-1.4		-0.2
Ratio																
Mg#	57.1	54.3	61.6	66.4	65.6	63.9	67.8	64.1	42.1	58.3	41.9	41.7	50.3	50.6	63.4	62.8
Sr/Y	21.0	36.7	10.5	12.7	12.8	19.0	11.8	7.60	3.78	7.51	4.06	4.17	7.60	6.37	13.3	12.8
Nb/La	0.47	0.33	0.53	0.38	0.52	0.46	0.35	0.26	0.49	0.56	0.52	0.52	0.26	0.56	0.46	0.43
Nb/U	10.7	8.02	12.8	10.7	31.2	10.1	13.7	9.00	28.4	11.6	17.2	28.3	9.00	46.6	29.7	32.6

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
			(Ma)	±1σ	$^{176}Yb/^{177}Hf$	±1σ	$^{176}Lu/^{177}Hf$	±1σ	$^{176}Hf/^{177}Hf$	±1σ			(Ma)	(Ma)	
Baoxing intrusions	gabbro-diorite	SC01-4.01	803	13	0.084449		0.001775		0.282546	0.000015	8.78		1.01	1.15	**Meng et al., 2015**
		SC01-4.02	803	11	0.074014		0.001245		0.282402	0.000013	3.99		0.88	1.46	
		SC01-4.03	803	12	0.072635		0.001617		0.282601	0.000013	10.83		0.92	1.02	
		SC01-4.04	801	11	0.093991		0.002028		0.282606	0.000013	10.75		0.93	1.02	
		SC01-4.05	802	11	0.077025		0.001707		0.282591	0.000015	10.39		1.02	1.05	
		SC01-4.06	804	12	0.073636		0.001656		0.282632	0.000016	11.91		1.12	0.95	
		SC01-4.11	806	12	0.069632		0.001819		0.282571	0.000011	9.73		0.75	1.09	
		SC01-4.13	801	15	0.089522		0.001992		0.282604	0.000014	10.68		0.95	1.03	
		SC01-4.14	798	12	0.090069		0.002054		0.282636	0.000012	11.72		0.86	0.96	
		SC01-4.15	851	12	0.073472		0.001788		0.282608	0.000012	12.00		0.79	0.98	
		SC01-4.16	847	13	0.036791		0.000874		0.28251	0.000011	8.95		0.74	1.17	
		SC01-4.17	847	13	0.070775		0.002397		0.282617	0.000011	11.90		0.73	0.98	
		SC01-4.18	852	14	0.08011		0.001923		0.28262	0.000012	12.36		0.85	0.96	
		SC01-4.19	846	15	0.051201		0.001379		0.282607	0.000010	12.09		0.66	0.97	
		SC01-4.20	850	14	0.070636		0.001746		0.282604	0.000012	11.84		0.80	0.99	
		SC01-4.21	844	12	0.155961		0.003741		0.282565	0.000012	9.23		0.84	1.15	
		SC01-4.22	804	12	0.046613		0.001221		0.282565	0.000011	9.77		0.72	1.09	
		SC01-4.25	798	12	0.068056		0.001637		0.2826	0.000009	10.66		0.64	1.03	
		SC01-4.26	801	12	0.05972		0.00133		0.282561	0.000013	9.53		0.89	1.10	
		SC01-4.27	806	11	0.143982		0.003652		0.282662	0.000012	11.94		0.82	0.95	
		SC01-4.28	802	12	0.066775		0.001586		0.28262	0.000012	11.48		0.85	0.98	
		SC01-4.29	850	13	0.066792		0.002231		0.282592	0.000012	11.16		0.85	1.04	
		SC01-4.30	848	12	0.106467		0.002573		0.282696	0.000012	14.62		0.84	0.81	
		SC01-4.31	797	12	0.061237		0.00162		0.282633	0.000011	11.82		0.73	0.95	
		SC01-4.32	799	12	0.071359		0.001678		0.282516	0.000009	7.68		0.63	1.22	
		SC02-1.01	851	12	0.093448		0.002916		0.28247	0.000014	6.45		0.95	1.34	
		SC02-1.02	899	13	0.162084		0.005088		0.282587	0.000014	10.29		0.96	1.13	
		SC02-1.03	856	12	0.028909		0.000671		0.282525	0.000012	9.81		0.80	1.13	
		SC02-1.08	849	13	0.10375		0.003361		0.282617	0.000015	11.39		1.05	1.02	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
			(Ma)	±1σ	$^{176}Yb/^{177}Hf$	±1σ	$^{176}Lu/^{177}Hf$	±1σ	$^{176}Hf/^{177}Hf$	±1σ			(Ma)	(Ma)	
		SC02-1.11	845	13	0.101585		0.002456		0.282616	0.000014	11.79		0.98	0.99	
		SC02-1.12	905	14	0.085116		0.002887		0.282593	0.000015	11.94		1.07	1.03	
		SC02-1.14	852	13	0.130528		0.003037		0.282607	0.000013	11.26		0.86	1.03	
		SC02-1.16	849	13	0.150997		0.004184		0.282533	0.000015	7.93		1.00	1.24	
		SC02-1.17	847	13	0.061299		0.001972		0.282518	0.000013	8.63		0.91	1.20	
		SC02-1.19	851	12	0.118374		0.00295		0.282596	0.000013	10.89		0.89	1.05	
		SC02-1.20	848	12	0.07138		0.001818		0.282519	0.000015	8.77		1.04	1.19	
		SC02-1.21	907	14	0.081563		0.002815		0.282596	0.000015	12.14		1.05	1.02	
		SC02-1.22	850	13	0.102315		0.003161		0.282578	0.000014	10.12		0.94	1.10	
		SC02-1.24	853	13	0.097645		0.002664		0.28256	0.000014	9.84		0.99	1.12	
		SC02-1.26	846	13	0.083107		0.00258		0.282569	0.000013	10.07		0.90	1.10	
		SC02-1.27	845	13	0.04025		0.001028		0.282511	0.000013	8.87		0.89	1.18	
		SC02-1.30	902	14	0.046031		0.001629		0.282537	0.000011	10.63		0.77	1.11	
		SC02-1.33	842	13	0.051184		0.001782		0.282538	0.000014	9.32		0.95	1.15	
		SC02-1.35	847	13	0.049093		0.001634		0.282423	0.000013	5.44		0.92	1.40	
		SC09-3.01	797	12	0.024253		0.000617		0.282353	0.000010	2.44		0.71	1.55	
		SC09-3.02	798	11	0.018457		0.000393		0.282299	0.000013	0.68		0.91	1.67	
		SC09-3.03	803	11	0.038314		0.000847		0.282327	0.000011	1.54		0.73	1.61	
		SC09-3.04	809	12	0.024126		0.000579		0.282372	0.000013	3.38		0.87	1.50	
		SC09-3.05	800	11	0.045431		0.001223		0.282375	0.000011	2.96		0.72	1.52	
		SC09-3.06	808	11	0.030489		0.000992		0.282388	0.000011	3.71		0.78	1.48	
		SC09-3.07	799	11	0.01989		0.000466		0.282386	0.000011	3.74		0.79	1.47	
		SC09-3.08	800	11	0.011909		0.000435		0.282309	0.000018	1.04		1.24	1.64	
		SC09-3.09	799	11	0.010517		0.000372		0.282381	0.000014	3.60		0.95	1.48	
		SC09-3.10	800	11	0.038366		0.00082		0.282374	0.000012	3.15		0.85	1.51	
		SC09-3.11	806	11	0.05487		0.001219		0.282306	0.000010	0.64		0.70	1.67	
		SC09-3.12	803	11	0.068791		0.001993		0.282309	0.000015	0.29		1.02	1.69	
		SC09-3.13	809	11	0.03226		0.000964		0.282355	0.000016	2.58		1.09	1.55	
		SC09-3.14	907	15	0.043922		0.001238		0.282387	0.000015	5.66		1.04	1.43	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
					$^{176}Yb/$		$^{176}Lu/$		$^{176}Hf/$						
			(Ma)	±1σ	^{177}Hf	±1σ	^{177}Hf	±1σ	^{177}Hf	±1σ			(Ma)	(Ma)	
Guandaoshan intrusion	gabbro-diorite	GDS10-1	856		0.115207	0.000393	0.004541	0.000011	0.282774	0.000021	13.81	0.75	863.00		**Zhu et al., 2021**
		GDS10-2	856		0.020238	0.000172	0.001044	0.000006	0.28264	0.000014	13.04	0.49	893.00		
		GDS10-3	856		0.075065	0.000180	0.003107	0.000003	0.2827	0.000017	12.83	0.60	904.00		
		GDS10-4	856		0.129986	0.000505	0.005074	0.000018	0.282796	0.000020	13.97	0.69	856.00		
		GDS10-5	856		0.060891	0.000322	0.002757	0.000018	0.282729	0.000017	14.27	0.60	844.00		
		GDS10-6	856		0.065506	0.000130	0.002766	0.000003	0.28272	0.000018	13.92	0.62	858.00		
		GDS10-7	856		0.031219	0.000242	0.00145	0.000010	0.282807	0.000016	18.52	0.55	672.00		
		GDS10-8	856		0.08395	0.000171	0.00332	0.000008	0.282706	0.000016	12.80	0.57	906.00		
		GDS10-9	856		0.111551	0.000298	0.004465	0.000010	0.282721	0.000019	12.02	0.67	942.00		
		GDS10-10	856		0.05831	0.000251	0.002564	0.000006	0.282778	0.000018	16.21	0.65	763.00		
		GDS10-11	856		0.099093	0.000459	0.003981	0.000013	0.28271	0.000020	12.20	0.70	933.00		
		GDS10-12	856		0.034218	0.000364	0.001435	0.000014	0.282646	0.000014	12.82	0.50	902.00		
		GDS10-13	856		0.113578	0.000037	0.004437	0.000002	0.282743	0.000019	12.83	0.65	906.00		
		GDS10-14	856		0.088134	0.000525	0.003656	0.000016	0.282604	0.000021	8.80	0.72	1077.00		
		GDS10-15	856		0.032825	0.000252	0.001358	0.000011	0.282649	0.000015	13.02	0.53	894.00		
		GDS10-16	856		0.083066	0.000245	0.003515	0.000012	0.282749	0.000022	14.11	0.77	850.00		
		GDS10-17	856		0.059122	0.000795	0.002614	0.000031	0.282581	0.000024	9.19	0.83	1054.00		
		GDS10-18	856		0.050268	0.000234	0.002414	0.000006	0.282675	0.000021	12.72	0.72	908.00		
		GDS10-19	856		0.050391	0.000086	0.0022	0.000002	0.282657	0.000020	12.34	0.69	923.00		
		GDS10-20	856		0.042932	0.000177	0.001828	0.000006	0.282658	0.000019	12.81	0.66	903.00		
		GDS10-21	856		0.047636	0.000214	0.002463	0.000013	0.282641	0.000030	11.48	1.05	959.00		
		GDS10-22	856		0.058904	0.000162	0.002688	0.000007	0.282906	0.000025	20.61	0.88	579.00		
		GDS10-23	856		0.040206	0.000168	0.00176	0.000008	0.282665	0.000018	13.13	0.63	890.00		
Ganyuhe intrusions	hornblende gabbro	GYH1-1	857		0.02587	0.000064	0.001051	0.000002	0.282595	0.000011	11.47	0.40	956.00		
		GYH1-2	857		0.034043	0.000082	0.00134	0.000003	0.282674	0.000013	13.94	0.46	858.00		
		GYH1-3	857		0.026995	0.000129	0.00109	0.000006	0.282715	0.000010	15.70	0.35	788.00		
		GYH1-4	857		0.021953	0.000058	0.000877	0.000003	0.282634	0.000012	13.05	0.40	893.00		
		GYH1-5	857		0.031316	0.000131	0.001243	0.000004	0.282727	0.000010	15.95	0.34	778.00		
		GYH1-6	857		0.016359	0.000112	0.000683	0.000005	0.282608	0.000011	12.35	0.38	921.00		

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
			(Ma)	±1σ	$^{176}Yb/^{177}Hf$	±1σ	$^{176}Lu/^{177}Hf$	±1σ	$^{176}Hf/^{177}Hf$	±1σ			(Ma)	(Ma)	
		GYH1-7	857		0.019455	0.000076	0.000781	0.000004	0.282702	0.000009	15.57	0.29	794.00		
		GYH1-8	857		0.018733	0.000124	0.000771	0.000006	0.282636	0.000010	13.26	0.36	885.00		
		GYH1-9	857		0.017865	0.000059	0.000724	0.000003	0.282683	0.000011	14.96	0.37	818.00		
		GYH1-10	857		0.018822	0.000069	0.000758	0.000003	0.28259	0.000011	11.65	0.37	949.00		
		GYH1-11	857		0.027861	0.000070	0.001108	0.000003	0.282675	0.000012	14.23	0.41	846.00		
		GYH1-12	857		0.016553	0.000110	0.000664	0.000004	0.28271	0.000011	15.99	0.38	777.00		
		GYH1-13	857		0.028091	0.000044	0.001098	0.000002	0.282595	0.000010	11.41	0.36	959.00		
		GYH1-14	857		0.035511	0.000053	0.001372	0.000002	0.282545	0.000011	9.34	0.38	1043.00		
		GYH1-15	857		0.015633	0.000094	0.000652	0.000004	0.28267	0.000010	14.58	0.36	833.00		
		GYH1-16	857		0.025111	0.000132	0.001024	0.000006	0.282666	0.000011	14.02	0.38	855.00		
		GYH1-17	857		0.021925	0.000048	0.000915	0.000003	0.282582	0.000011	11.16	0.37	968.00		
		GYH1-18	857		0.019353	0.000027	0.00079	0.000001	0.282668	0.000010	14.37	0.34	841.00		
		GYH1-19	857		0.022715	0.000072	0.000914	0.000003	0.282681	0.000010	14.67	0.35	829.00		
		GYH1-20	857		0.02355	0.000110	0.000974	0.000004	0.282508	0.000014	8.48	0.49	1075.00		
		GYH1-21	857		0.017605	0.000015	0.000727	0.000001	0.282597	0.000010	11.92	0.36	938.00		
		GYH1-22	857		0.014557	0.000056	0.000613	0.000003	0.282694	0.000010	15.48	0.33	797.00		
		GYH1-23	857		0.027135	0.000247	0.001118	0.000010	0.282675	0.000010	14.23	0.36	846.00		
		GYH1-24	857		0.017478	0.000098	0.00075	0.000003	0.282597	0.000012	11.91	0.41	938.00		
		GYH1-25	857		0.022071	0.000122	0.000881	0.000005	0.282618	0.000009	12.48	0.32	916.00		
		GYH1-26	857		0.023078	0.000094	0.000906	0.000003	0.28262	0.000011	12.53	0.40	914.00		
		GYH1-27	857		0.028978	0.000175	0.001132	0.000007	0.28255	0.000011	9.78	0.37	1024.00		
		GYH1-28	857		0.029459	0.000039	0.001299	0.000001	0.2826	0.000016	11.39	0.55	961.00		
		GYH1-29	857		0.026877	0.000104	0.00113	0.000003	0.282636	0.000012	12.85	0.41	902.00		
		GYH1-30	857		0.013406	0.000051	0.00061	0.000004	0.282586	0.000012	11.65	0.41	948.00		
		GYH1-31	857		0.02247	0.000041	0.000888	0.000002	0.282648	0.000010	13.53	0.35	874.00		
		GYH1-32	857		0.0326	0.000040	0.001294	0.000002	0.282689	0.000011	14.54	0.40	834.00		
		GYH1-33	857		0.034661	0.000073	0.001442	0.000004	0.282588	0.000013	10.80	0.46	985.00		
		GYH1-34	857		0.014299	0.000051	0.000614	0.000003	0.282682	0.000011	15.07	0.39	813.00		
		GYH1-35	857		0.013037	0.000036	0.000565	0.000002	0.282582	0.000012	11.58	0.42	951.00		

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
			(Ma)	±1σ	$^{176}Yb/^{177}Hf$	±1σ	$^{176}Lu/^{177}Hf$	±1σ	$^{176}Hf/^{177}Hf$	±1σ			(Ma)	(Ma)	
Dajianshan intrusions	gabbro-diorite	GYH1-36	857		0.015108	0.000054	0.000649	0.000004	0.282594	0.000010	11.91	0.36	938.00		Zhu et al., 2019
		DJS1-1	810		0.021981	0.000171	0.000759	0.000006	0.282521	0.000010	8.18	0.34	1045.00	1187.00	
		DJS1-2	810		0.013462	0.000023	0.000486	0.000001	0.282505	0.000008	7.90	0.27	1054.00	1204.00	
		DJS1-3	810		0.016782	0.000166	0.000611	0.000005	0.282468	0.000009	6.48	0.31	1111.00	1294.00	
		DJS1-4	810		0.022973	0.000073	0.000778	0.000003	0.282468	0.000009	6.29	0.30	1120.00	1306.00	
		DJS1-5	810		0.014931	0.000116	0.000528	0.000004	0.282503	0.000008	7.80	0.29	1059.00	1211.00	
		DJS1-6	810		0.014392	0.000031	0.000501	0.000001	0.282446	0.000009	5.81	0.32	1136.00	1336.00	
		DJS1-7	810		0.018272	0.000126	0.000656	0.000005	0.28247	0.000009	6.49	0.30	1111.00	1293.00	
Qizanmi intrusions	gabbro	11AL15-1-1	748		0.282456	0.000016	0.0006	0.000032	0.017113	0.000877	4.80		1120.00		Liu et al., 2019
		11AL15-1-2	748		0.282482	0.000013	0.000862	0.000013	0.024473	0.000295	5.50		1090.00		
		11AL15-1-3	748		0.282456	0.000021	0.000735	0.000028	0.024572	0.000959	4.70		1120.00		
		11AL15-1-4	748		0.28245	0.000019	0.000709	0.000021	0.021215	0.000299	4.50		1130.00		
		11AL15-1-5	748		0.282459	0.000020	0.0006	0.000007	0.021716	0.000392	4.90		1110.00		
		11AL15-1-6	748		0.282463	0.000024	0.001155	0.000047	0.03347	0.000965	4.70		1120.00		
		11AL15-1-7	748		0.282474	0.000022	0.001052	0.000066	0.034565	0.002352	5.20		1100.00		
		11AL15-1-8	748		0.28247	0.000018	0.000544	0.000008	0.016446	0.000233	5.30		1090.00		
		11AL15-1-9	748		0.282454	0.000016	0.000274	0.000004	0.008786	0.000118	4.90		1110.00		
		11AL15-1-10	748		0.28248	0.000019	0.000478	0.000015	0.013223	0.000451	5.70		1080.00		
		11AL15-1-12	748		0.282463	0.000014	0.000761	0.000015	0.023468	0.000633	4.90		1110.00		
		11AL15-1-13	748		0.282489	0.000016	0.000574	0.000021	0.015989	0.000682	6.00		1070.00		
Baoxing intrusions		HSH5-1	857		0.034608	0.000759	0.000819	0.000009	0.282560	0.000017	10.99	0.59	0.97	1.05	Zhao et al., 2019
		HSH5-2	863		0.025250	0.001200	0.000623	0.000017	0.282555	0.000017	11.04	0.58	0.98	1.05	
		HSH5-3	868		0.068524	0.000705	0.001748	0.000023	0.282572	0.000016	11.13	0.57	0.98	1.05	
		HSH5-4	807		0.052805	0.000510	0.001811	0.000016	0.282587	0.000019	10.32	0.68	0.96	1.06	
		HSH5-5	858		0.037348	0.000931	0.000896	0.000014	0.282583	0.000014	11.78	0.48	0.94	1.00	
		HSH5-6	870		0.021582	0.000270	0.000485	0.000001	0.282564	0.000013	11.63	0.45	0.96	1.02	
		HSH5-7	867		0.035697	0.000546	0.000850	0.000026	0.282548	0.000015	10.77	0.53	0.99	1.07	
		HSH5-8	863		0.029121	0.000682	0.000692	0.000027	0.282607	0.000018	12.85	0.64	0.91	0.94	
		HSH5-9	854		0.065074	0.000572	0.001567	0.000030	0.282596	0.000014	11.76	0.48	0.94	1.00	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
					$^{176}Yb/$		$^{176}Lu/$		$^{176}Hf/$						
			(Ma)	±1σ	^{177}Hf	±1σ	^{177}Hf	±1σ	^{177}Hf	±1σ			(Ma)	(Ma)	
		HSH5-10	866		0.057384	0.000516	0.001429	0.000025	0.282575	0.000017	11.38	0.59	0.97	1.03	
		HSH5-11	885		0.070301	0.000599	0.001664	0.000031	0.282576	0.000015	11.69	0.54	0.97	1.03	
		HSH5-12	880		0.043982	0.001141	0.001045	0.000017	0.282568	0.000016	11.65	0.55	0.97	1.03	
		HSH5-13	897		0.035256	0.000327	0.000878	0.000008	0.282567	0.000017	12.09	0.59	0.97	1.01	
		HSH5-14	857		0.102830	0.002653	0.002191	0.000025	0.282586	0.000016	11.14	0.56	0.97	1.04	
		HSH5-15	850		0.068857	0.003786	0.001525	0.000064	0.282604	0.000013	12.01	0.47	0.93	0.98	
		HSH5-16	881		0.055282	0.000613	0.001334	0.000021	0.282627	0.000018	13.60	0.63	0.89	0.90	
		HSH5-17	891		0.036648	0.000809	0.000898	0.000005	0.282575	0.000014	12.24	0.49	0.95	1.00	
		HSH5-18	887		0.039231	0.000485	0.001114	0.000033	0.282587	0.000015	12.43	0.51	0.94	0.98	
		HSH5-19	869		0.062010	0.000721	0.002045	0.000037	0.282665	0.000025	14.24	0.88	0.86	0.85	
		HSH5-20	873		0.049809	0.002317	0.001370	0.000100	0.282563	0.000018	11.12	0.64	0.98	1.06	
		HSH5-21	895		0.033473	0.000311	0.000783	0.000006	0.282563	0.000016	11.95	0.55	0.97	1.02	
		HSH5-22	875		0.036774	0.000947	0.001084	0.000053	0.282587	0.000017	12.17	0.58	0.94	0.99	
		HSH5-23	855		0.022407	0.000239	0.000754	0.000013	0.282583	0.000018	11.82	0.63	0.94	1.00	
		HSH5-24	952		0.053056	0.001872	0.001227	0.000021	0.282545	0.000020	12.27	0.68	1.01	1.04	
		HSH5-25	831		0.037393	0.001314	0.001216	0.000043	0.282578	0.000025	10.83	0.86	0.96	1.04	
		HSH5-26	861		0.066802	0.000367	0.001951	0.000037	0.282617	0.000026	12.45	0.90	0.92	0.96	
		HSH5-27	893		0.043222	0.001035	0.001217	0.000060	0.282590	0.000017	12.62	0.59	0.94	0.97	
		HSH5-28	885		0.021656	0.000070	0.000530	0.000009	0.282532	0.000017	10.76	0.61	1.01	1.09	
		HSH21-1	883		0.071246	0.000600	0.001654	0.000021	0.282580	0.000014	11.80	0.50	0.97	1.02	
		HSH21-2	880		0.073899	0.000332	0.001790	0.000021	0.282586	0.000017	11.86	0.61	0.96	1.01	
		HSH21-3	866		0.068013	0.001277	0.001583	0.000017	0.282575	0.000014	11.28	0.50	0.97	1.04	
		HSH21-4	863		0.089497	0.001417	0.002121	0.000033	0.282566	0.000016	10.57	0.57	1.00	1.08	
		HSH21-5	859		0.061647	0.000633	0.001461	0.000025	0.282610	0.000014	12.46	0.50	0.92	0.96	
		HSH21-6	873		0.073243	0.000705	0.001732	0.000014	0.282592	0.000016	11.95	0.57	0.95	1.00	
		HSH21-7	846		0.025732	0.000460	0.000663	0.000008	0.282566	0.000016	11.06	0.57	0.96	1.04	
		HSH21-8	821		0.054613	0.000775	0.001468	0.000062	0.282587	0.000015	10.79	0.52	0.95	1.04	
		HSH21-9	862		0.084427	0.001313	0.001942	0.000051	0.282641	0.000015	13.30	0.53	0.89	0.91	
		HSH21-10	863		0.069993	0.001195	0.001620	0.000024	0.282590	0.000015	11.71	0.53	0.95	1.01	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
			(Ma)	±1σ	$^{176}Yb/^{177}Hf$	±1σ	$^{176}Lu/^{177}Hf$	±1σ	$^{176}Hf/^{177}Hf$	±1σ			(Ma)	(Ma)	
		HSH21-11	831		0.064002	0.001169	0.001455	0.000019	0.282576	0.000016	10.63	0.55	0.97	1.05	
		HSH21-12	867		0.077393	0.002112	0.001753	0.000059	0.282619	0.000013	12.75	0.46	0.91	0.95	
		HSH21-13	879		0.084667	0.000866	0.002035	0.000032	0.282634	0.000017	13.37	0.58	0.90	0.91	
		HSH21-14	861		0.073376	0.001321	0.001750	0.000044	0.282576	0.000015	11.11	0.53	0.98	1.05	
		HSH21-15	883		0.062247	0.001370	0.001461	0.000039	0.282598	0.000016	12.52	0.54	0.94	0.97	
		HSH21-16	860		0.069584	0.003394	0.001654	0.000046	0.282598	0.000019	11.95	0.67	0.94	0.99	
		HSH21-17	839		0.089395	0.000424	0.002112	0.000017	0.282574	0.000014	10.40	0.50	0.99	1.08	
		HSH21-18	901		0.078845	0.002446	0.001816	0.000061	0.282623	0.000014	13.58	0.50	0.91	0.92	
		HSH21-19	887		0.081536	0.001166	0.001866	0.000027	0.282621	0.000014	13.20	0.49	0.91	0.93	
		HSH21-20	900		0.064979	0.002017	0.001491	0.000027	0.282548	0.000017	11.10	0.59	1.01	1.08	
		HSH21-21	890		0.078803	0.001347	0.001868	0.000032	0.282670	0.000016	14.98	0.57	0.84	0.82	
		HSH21-22	874		0.053779	0.000445	0.001256	0.000016	0.282623	0.000015	13.34	0.54	0.90	0.91	
		HSH21-23	878		0.068564	0.001707	0.001635	0.000044	0.282607	0.000016	12.65	0.56	0.93	0.96	
		HSH21-24	898		0.057357	0.000621	0.001376	0.000019	0.282644	0.000015	14.53	0.54	0.87	0.85	
		HSH21-25	897		0.073861	0.001829	0.001886	0.000020	0.282555	0.000019	11.05	0.65	1.01	1.08	
		HSH21-26	900		0.078818	0.001791	0.002008	0.000041	0.282636	0.000015	13.90	0.53	0.90	0.90	
		HSH21-27	909		0.078086	0.001908	0.001812	0.000058	0.282636	0.000012	14.23	0.41	0.89	0.88	
		HSH21-28	853		0.063041	0.000632	0.001490	0.000016	0.282617	0.000012	12.54	0.43	0.91	0.95	
		HSH21-29	852		0.056415	0.001300	0.001371	0.000017	0.282598	0.000015	11.92	0.53	0.93	0.99	
Tongde intrusions		TD2-1	857		0.023143	0.000370	0.000452	0.000003	0.282440	0.000018	6.94	0.64	1.13	1.31	
		TD2-2	843		0.012232	0.000107	0.000248	0.000004	0.282379	0.000016	4.58	0.56	1.21	1.45	
		TD2-3	844		0.016977	0.000143	0.000344	0.000004	0.282358	0.000018	3.82	0.63	1.24	1.50	
		TD2-4	857		0.013080	0.000155	0.000264	0.000001	0.282372	0.000016	4.64	0.57	1.22	1.46	
		TD2-5	865		0.017816	0.000923	0.000347	0.000012	0.282354	0.000016	4.15	0.55	1.25	1.50	
		TD2-6	858		0.014857	0.000121	0.000308	0.000005	0.282391	0.000017	5.33	0.60	1.19	1.41	
		TD2-7	893		0.014508	0.000237	0.000306	0.000008	0.282402	0.000017	6.49	0.59	1.18	1.37	
		TD2-8	866		0.042733	0.001028	0.000855	0.000026	0.282383	0.000017	4.88	0.59	1.22	1.45	
		TD2-9	863		0.015189	0.000053	0.000309	0.000003	0.282399	0.000016	5.72	0.56	1.18	1.39	
		TD2-10	831		0.017203	0.000472	0.000344	0.000004	0.282369	0.000017	3.92	0.60	1.23	1.48	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
			(Ma)	±1σ	$^{176}Yb/^{177}Hf$	±1σ	$^{176}Lu/^{177}Hf$	±1σ	$^{176}Hf/^{177}Hf$	±1σ			(Ma)	(Ma)	
		TD2-11	883		0.022850	0.000181	0.000447	0.000007	0.282415	0.000015	6.63	0.54	1.17	1.35	
		TD2-12	850		0.031072	0.000511	0.000622	0.000005	0.282404	0.000017	5.44	0.61	1.19	1.40	
		TD2-13	845		0.011673	0.000406	0.000237	0.000005	0.282381	0.000015	4.73	0.54	1.21	1.44	
		TD2-14	838		0.008490	0.000186	0.000179	0.000001	0.282394	0.000014	5.08	0.48	1.19	1.42	
		TD2-15	842		0.020354	0.000409	0.000414	0.000012	0.282396	0.000018	5.09	0.65	1.19	1.42	
		TD2-16	859		0.017762	0.000288	0.000371	0.000007	0.282420	0.000018	6.33	0.63	1.16	1.35	
		TD2-17	849		0.011777	0.000205	0.000247	0.000002	0.282422	0.000016	6.25	0.54	1.15	1.35	
		TD2-18	855		0.022374	0.000198	0.000440	0.000001	0.282437	0.000017	6.80	0.60	1.14	1.32	
		TD2-19	874		0.040305	0.001527	0.000836	0.000037	0.282425	0.000018	6.57	0.61	1.16	1.35	
		TD2-20	894		0.015198	0.000240	0.000310	0.000007	0.282429	0.000015	7.45	0.52	1.14	1.31	
		TD2-21	858		0.012496	0.000082	0.000249	0.000003	0.282401	0.000016	5.72	0.56	1.18	1.39	
		TD2-22	868		0.009085	0.000249	0.000191	0.000005	0.282424	0.000018	6.79	0.62	1.15	1.33	
		TD2-23	867		0.020876	0.000090	0.000418	0.000005	0.282390	0.000015	5.43	0.53	1.20	1.42	
		TD2-24	845		0.013801	0.000697	0.000280	0.000011	0.282387	0.000017	4.91	0.59	1.20	1.43	
		TD2-25	847		0.018680	0.000633	0.000378	0.000007	0.282388	0.000019	4.91	0.66	1.20	1.43	
		TD2-26	841		0.010180	0.000116	0.000218	0.000002	0.282421	0.000014	6.04	0.50	1.15	1.36	
		TD19-1	853		0.017559	0.000126	0.000352	0.000004	0.282454	0.000014	7.44	0.48	1.11	1.28	
		TD19-2	843		0.009781	0.000101	0.000210	0.000001	0.282411	0.000015	5.77	0.53	1.16	1.38	
		TD19-3	831		0.013327	0.000351	0.000268	0.000005	0.282401	0.000012	5.09	0.43	1.18	1.41	
		TD19-4	836		0.010108	0.000071	0.000211	0.000001	0.282408	0.000015	5.47	0.51	1.17	1.39	
		TD19-5	850		0.022710	0.000525	0.000452	0.000004	0.282399	0.000013	5.34	0.47	1.19	1.41	
		TD19-6	856		0.030301	0.001048	0.000586	0.000013	0.282420	0.000016	6.14	0.57	1.16	1.36	
		TD19-7	899		0.013260	0.000087	0.000272	0.000003	0.282423	0.000013	7.40	0.47	1.15	1.31	
		TD19-8	816		0.019241	0.001223	0.000407	0.000030	0.282447	0.000016	6.32	0.57	1.12	1.32	
		TD19-9	855		0.027200	0.001711	0.000540	0.000028	0.282415	0.000015	5.96	0.52	1.17	1.37	
		TD19-10	806		0.016137	0.000111	0.000334	0.000001	0.282438	0.000014	5.81	0.51	1.13	1.34	
		TD19-11	814		0.023319	0.001288	0.000457	0.000015	0.282398	0.000021	4.51	0.74	1.19	1.43	
		TD19-12	874		0.025630	0.001663	0.000644	0.000047	0.282492	0.000022	9.04	0.78	1.06	1.19	
		TD19-13	956		0.022651	0.000250	0.000479	0.000002	0.282387	0.000013	7.23	0.45	1.21	1.37	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
			(Ma)	±1σ	$^{176}Yb/^{177}Hf$	±1σ	$^{176}Lu/^{177}Hf$	±1σ	$^{176}Hf/^{177}Hf$	±1σ			(Ma)	(Ma)	
		TD19-14	878		0.022156	0.000346	0.000424	0.000003	0.282390	0.000015	5.66	0.54	1.20	1.41	
		TD19-15	885		0.014426	0.000283	0.000305	0.000008	0.282388	0.000014	5.80	0.51	1.20	1.41	
		TD19-16	855		0.016975	0.000253	0.000349	0.000007	0.282428	0.000017	6.55	0.61	1.14	1.34	
		TD19-17	826		0.011408	0.000180	0.000232	0.000002	0.282393	0.000016	4.72	0.55	1.19	1.43	
		TD19-18	849		0.018551	0.000388	0.000372	0.000010	0.282411	0.000013	5.77	0.46	1.17	1.38	
		TD19-19	1047		0.016835	0.000547	0.000338	0.000009	0.282443	0.000018	11.33	0.64	1.12	1.18	
		TD19-20	820		0.012306	0.000073	0.000263	0.000003	0.282377	0.000015	4.01	0.53	1.21	1.47	
		TD19-21	841		0.043283	0.000606	0.000932	0.000019	0.282424	0.000016	5.78	0.57	1.17	1.37	
		TD19-22	854		0.034079	0.000376	0.000747	0.000004	0.282411	0.000016	5.68	0.57	1.18	1.39	
		TD19-23	871		0.014670	0.000224	0.000296	0.000002	0.282455	0.000016	7.89	0.56	1.11	1.26	
		TD19-24	883		0.009430	0.000161	0.000215	0.000002	0.282468	0.000015	8.66	0.53	1.09	1.22	
		TD19-25	876		0.035471	0.000492	0.000711	0.000003	0.282460	0.000015	7.93	0.54	1.11	1.26	
		TD19-26	860		0.019788	0.000358	0.000390	0.000002	0.282442	0.000016	7.10	0.56	1.13	1.30	
		TD19-27	867		0.016797	0.000308	0.000363	0.000005	0.282386	0.000017	5.33	0.61	1.20	1.42	
		TD19-28	978		0.011765	0.000283	0.000243	0.000003	0.282418	0.000017	8.96	0.58	1.16	1.28	
		TD19-29	851		0.024147	0.000068	0.000519	0.000004	0.282403	0.000016	5.49	0.56	1.18	1.40	
		TD19-30	868		0.022693	0.000504	0.000459	0.000004	0.282410	0.000019	6.11	0.65	1.17	1.37	
		TD19-31	870		0.006985	0.000088	0.000155	0.000001	0.282411	0.000016	6.37	0.54	1.16	1.36	
		TD19-32	841		0.018460	0.000367	0.000369	0.000007	0.282456	0.000017	7.22	0.58	1.11	1.28	
Gaojiacun intrusions		GJC2-1	847		0.080279	0.003277	0.001960	0.000090	0.282542	0.000022	9.49	0.78	1.03	1.14	
		GJC2-2	868		0.133812	0.004052	0.003106	0.000071	0.282535	0.000020	9.02	0.69	1.07	1.19	
		GJC2-3	859		0.162678	0.001295	0.004165	0.000054	0.282562	0.000023	9.20	0.80	1.07	1.17	
		GJC2-4	857		0.164292	0.003965	0.003721	0.000092	0.282534	0.000015	8.41	0.53	1.09	1.22	
		GJC2-5	877		0.052907	0.002224	0.001351	0.000053	0.282519	0.000018	9.68	0.62	1.05	1.15	
		GJC2-6	903		0.071861	0.000553	0.001876	0.000027	0.282513	0.000020	9.70	0.70	1.07	1.17	
		GJC2-7	884		0.186431	0.002406	0.004208	0.000040	0.282552	0.000026	9.29	0.92	1.08	1.18	
		GJC2-8	840		0.083761	0.001223	0.002032	0.000054	0.282550	0.000018	9.59	0.62	1.02	1.13	
		GJC2-9	851		0.043928	0.002456	0.001002	0.000063	0.282547	0.000018	10.30	0.63	1.00	1.09	
		GJC2-10	848		0.085536	0.001170	0.002021	0.000011	0.282602	0.000017	11.59	0.60	0.95	1.01	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
					$^{176}Yb/$		$^{176}Lu/$		$^{176}Hf/$						
			(Ma)	±1σ	^{177}Hf	±1σ	^{177}Hf	±1σ	^{177}Hf	±1σ			(Ma)	(Ma)	
		GJC2-11	860		0.122398	0.001147	0.002993	0.000009	0.282533	0.000016	8.86	0.57	1.07	1.19	
		GJC2-12	856		0.118926	0.001123	0.002796	0.000024	0.282461	0.000020	6.31	0.71	1.17	1.35	
		GJC2-13	846		0.106300	0.005956	0.002659	0.000137	0.282489	0.000015	7.19	0.52	1.13	1.29	
		GJC2-14	847		0.116289	0.000857	0.002674	0.000011	0.282544	0.000018	9.17	0.63	1.05	1.16	
		GJC2-15	858		0.078927	0.004368	0.001820	0.000071	0.282522	0.000015	9.11	0.53	1.06	1.17	
		GJC2-16	849		0.114967	0.002613	0.002891	0.000075	0.282558	0.000022	9.58	0.76	1.03	1.14	
		GJC2-17	857		0.111462	0.001682	0.002790	0.000055	0.282535	0.000021	8.98	0.75	1.07	1.18	
		GJC2-18	852		0.132369	0.005330	0.002913	0.000099	0.282466	0.000017	6.37	0.60	1.17	1.34	
		GJC2-19	825		0.095971	0.001012	0.002362	0.000035	0.282520	0.000021	8.04	0.75	1.07	1.22	
		GJC2-20	847		0.125383	0.008620	0.002975	0.000225	0.282580	0.000020	10.28	0.72	1.00	1.09	
		GJC2-21	852		0.254177	0.002877	0.005563	0.000037	0.282642	0.000025	11.10	0.88	0.98	1.04	
		GJC2-22	842		0.099094	0.001982	0.002418	0.000062	0.282472	0.000021	6.63	0.75	1.15	1.32	
		GJC2-23	862		0.134496	0.000894	0.003067	0.000030	0.282545	0.000019	9.28	0.66	1.06	1.16	
		GJC2-24	856		0.210450	0.009664	0.004888	0.000259	0.282629	0.000024	11.07	0.85	0.98	1.04	
		GJC4-1	900		0.053044	0.000859	0.001031	0.000009	0.282470	0.000017	8.63	0.58	1.11	1.24	
		GJC4-2	849		0.043065	0.000326	0.000860	0.000016	0.282489	0.000016	8.27	0.56	1.08	1.22	
		GJC4-3	835		0.042771	0.001676	0.000810	0.000037	0.282438	0.000015	6.18	0.53	1.15	1.34	
		GJC4-4	871		0.018285	0.000586	0.000353	0.000004	0.282430	0.000016	6.98	0.57	1.14	1.32	
		GJC4-5	848		0.017021	0.000311	0.000360	0.000001	0.282350	0.000024	3.63	0.84	1.25	1.52	
		GJC4-6	853		0.028061	0.000906	0.000585	0.000012	0.282536	0.000031	10.20	1.10	1.00	1.10	
		GJC4-7	838		0.014947	0.000106	0.000372	0.000014	0.282208	0.000035	-1.66	1.22	1.45	1.84	
		GJC4-8	839		0.038755	0.001579	0.000750	0.000017	0.282318	0.000051	2.07	1.79	1.31	1.61	
		GJC4-9	828		0.033065	0.000639	0.000612	0.000001	0.282401	0.000013	4.82	0.45	1.19	1.42	
		GJC4-10	846		0.017940	0.000329	0.000351	0.000001	0.282470	0.000014	7.85	0.51	1.09	1.24	
		GJC4-11	859		0.027736	0.001715	0.000547	0.000025	0.282445	0.000012	7.11	0.41	1.13	1.30	
		GJC4-12	850		0.025912	0.000490	0.000509	0.000005	0.282431	0.000013	6.46	0.45	1.14	1.34	
		GJC4-13	853		0.042485	0.000319	0.000809	0.000006	0.282455	0.000014	7.17	0.49	1.12	1.29	
		GJC4-14	855		0.049348	0.001271	0.001002	0.000007	0.282433	0.000015	6.36	0.53	1.16	1.35	
		GJC4-15	833		0.052706	0.001528	0.000982	0.000018	0.282468	0.000013	7.12	0.46	1.11	1.28	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
			(Ma)	±1σ	$^{176}Yb/^{177}Hf$	±1σ	$^{176}Lu/^{177}Hf$	±1σ	$^{176}Hf/^{177}Hf$	±1σ			(Ma)	(Ma)	
		GJC4-16	830		0.032118	0.000576	0.000609	0.000003	0.282431	0.000014	5.96	0.49	1.15	1.35	
		GJC4-17	1702		0.017282	0.000545	0.000351	0.000006	0.282439	0.000012	25.84	0.43	1.13	0.74	
		GJC4-18	838		0.018394	0.000283	0.000387	0.000006	0.282426	0.000012	6.08	0.44	1.15	1.35	
		GJC4-19	844		0.045238	0.000312	0.000888	0.000006	0.282424	0.000014	5.84	0.49	1.17	1.37	
		GJC4-20	877		0.060771	0.001776	0.001093	0.000031	0.282467	0.000013	7.97	0.45	1.11	1.26	
		GJC4-21	822		0.021596	0.000647	0.000526	0.000028	0.282480	0.000017	7.56	0.60	1.08	1.24	
		GJC4-22	815		0.070740	0.002536	0.001413	0.000033	0.282436	0.000015	5.36	0.52	1.17	1.38	
		GJC4-23	907		0.099537	0.002482	0.002558	0.000060	0.282492	0.000027	8.63	0.96	1.12	1.24	
		GJC4-24	845		0.021409	0.000864	0.000444	0.000020	0.282442	0.000015	6.78	0.51	1.13	1.31	
		GJC4-25	883		0.049373	0.000444	0.000954	0.000004	0.282466	0.000013	8.16	0.46	1.11	1.25	
		GJC4-26	838		0.032341	0.000325	0.000666	0.000009	0.282449	0.000012	6.73	0.42	1.13	1.31	
		GJC4-27	958		0.023642	0.001415	0.000460	0.000019	0.282459	0.000013	9.82	0.47	1.11	1.20	
		GJC4-28	853		0.021509	0.000716	0.000517	0.000030	0.282427	0.000016	6.37	0.55	1.15	1.34	
Lengshuiqing intrusions		LSQ23-1	819		0.012654	0.000142	0.000271	0.000006	0.282442	0.000013	6.30	0.44	1.12	1.32	
		LSQ23-2	813		0.017866	0.000164	0.000401	0.000008	0.282456	0.000016	6.56	0.54	1.11	1.30	
		LSQ23-3	835		0.043537	0.000147	0.000871	0.000009	0.282472	0.000015	7.38	0.53	1.10	1.27	
		LSQ23-4	857		0.013693	0.000201	0.000293	0.000001	0.282399	0.000015	5.61	0.51	1.18	1.40	
		LSQ23-5	812		0.028642	0.000322	0.000577	0.000002	0.282477	0.000015	7.23	0.52	1.08	1.26	
		LSQ23-6	807		0.017073	0.000131	0.000381	0.000002	0.282434	0.000014	5.68	0.50	1.14	1.35	
		LSQ23-7	839		0.035031	0.000641	0.000717	0.000002	0.282496	0.000014	8.40	0.50	1.06	1.20	
		LSQ23-8	812		0.043237	0.000549	0.000922	0.000003	0.282462	0.000014	6.51	0.48	1.11	1.30	
		LSQ23-9	844		0.021420	0.000132	0.000465	0.000009	0.282455	0.000016	7.19	0.57	1.11	1.28	
		LSQ23-10	819		0.033756	0.000322	0.000676	0.000003	0.282517	0.000018	8.72	0.62	1.03	1.17	
		LSQ23-11	847		0.042707	0.000780	0.000983	0.000027	0.282476	0.000013	7.70	0.45	1.10	1.25	
		LSQ23-12	854		0.061638	0.000511	0.001315	0.000009	0.282477	0.000018	7.70	0.63	1.11	1.26	
		LSQ23-13	831		0.016142	0.000234	0.000397	0.000002	0.282421	0.000016	5.73	0.55	1.16	1.37	
		LSQ23-14	846		0.053326	0.000722	0.001098	0.000015	0.282480	0.000015	7.77	0.51	1.09	1.25	
		LSQ23-15	851		0.053881	0.001005	0.001120	0.000009	0.282496	0.000014	8.40	0.47	1.07	1.21	
		LSQ23-16	847		0.019393	0.000794	0.000406	0.000011	0.282435	0.000015	6.58	0.52	1.14	1.33	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
					$^{176}Yb/^{177}Hf$	±1σ	$^{176}Lu/^{177}Hf$	±1σ	$^{176}Hf/^{177}Hf$	±1σ			(Ma)	(Ma)	
			(Ma)	±1σ											
		LSQ23-17	934		0.025915	0.000466	0.000518	0.000003	0.282403	0.000016	7.32	0.56	1.18	1.35	
		LSQ23-18	860		0.022544	0.000200	0.000507	0.000004	0.282469	0.000015	8.00	0.54	1.09	1.24	
		LSQ23-19	841		0.033354	0.000417	0.000750	0.000014	0.282432	0.000017	6.14	0.60	1.15	1.35	
		LSQ23-20	823		0.032503	0.000467	0.000711	0.000002	0.282406	0.000016	4.87	0.54	1.19	1.42	
		LSQ23-21	853		0.023451	0.000439	0.000475	0.000003	0.282407	0.000014	5.68	0.50	1.18	1.39	
		LSQ23-22	835		0.049198	0.000731	0.001033	0.000018	0.282168	0.000016	-3.48	0.57	1.53	1.96	
		LSQ23-23	826		0.012800	0.000492	0.000292	0.000007	0.282429	0.000017	5.98	0.59	1.14	1.35	
		LSQ23-24	853		0.060953	0.000773	0.001429	0.000009	0.282483	0.000017	7.86	0.61	1.10	1.25	
		LSQ23-25	890		0.020398	0.000179	0.000426	0.000005	0.282432	0.000016	7.40	0.56	1.14	1.31	
		LSQ23-26	844		0.016139	0.000064	0.000364	0.000006	0.282399	0.000017	5.25	0.60	1.19	1.41	
		LSQ23-27	864		0.021389	0.000608	0.000462	0.000007	0.282418	0.000018	6.34	0.63	1.16	1.36	
		LSQ23-28	838		0.039269	0.001937	0.000746	0.000027	0.282167	0.000015	-3.31	0.52	1.52	1.95	
		LSQ23-29	824		0.028623	0.000491	0.000654	0.000002	0.282434	0.000017	5.89	0.59	1.15	1.35	
		LSQ23-30	845		0.067229	0.000666	0.001374	0.000007	0.282462	0.000016	6.96	0.56	1.13	1.30	
		LSQ23-31	832		0.057673	0.001140	0.001524	0.000062	0.282430	0.000018	5.44	0.64	1.18	1.39	
		LSQ23-32	892		0.028362	0.001051	0.000652	0.000014	0.282457	0.000020	8.22	0.70	1.11	1.26	
Dadukou intrusions		DDK26-1	800		0.038321	0.000698	0.000739	0.000024	0.282475	0.000016	6.77	0.55	1.09	1.28	
		DDK26-2	811		0.060996	0.000899	0.001192	0.000032	0.282488	0.000012	7.23	0.42	1.09	1.26	
		DDK26-3	822		0.065712	0.001912	0.001244	0.000018	0.282424	0.000013	5.17	0.47	1.18	1.40	
		DDK26-4	827		0.092001	0.000528	0.001781	0.000010	0.282506	0.000014	7.91	0.48	1.08	1.23	
		DDK26-5	799		0.075266	0.001890	0.001401	0.000053	0.282486	0.000013	6.80	0.46	1.10	1.28	
		DDK26-6	812		0.166118	0.001917	0.003089	0.000064	0.282568	0.000018	9.07	0.62	1.02	1.14	
		DDK26-7	811		0.058237	0.003625	0.001155	0.000082	0.282497	0.000017	7.58	0.60	1.07	1.23	
		DDK26-8	688		0.063943	0.001325	0.001197	0.000007	0.282480	0.000016	4.30	0.57	1.10	1.35	
		DDK26-9	811		0.061967	0.000760	0.001196	0.000005	0.282446	0.000014	5.74	0.49	1.15	1.35	
		DDK26-10	780		0.094754	0.000565	0.001804	0.000027	0.282510	0.000016	7.02	0.55	1.07	1.25	
		DDK26-11	811		0.039905	0.000313	0.000766	0.000016	0.282452	0.000014	6.18	0.49	1.12	1.32	
		DDK26-12	806		0.084251	0.002346	0.001515	0.000018	0.282455	0.000015	5.78	0.54	1.14	1.35	
		DDK26-13	805		0.042220	0.000423	0.000811	0.000014	0.282439	0.000014	5.56	0.48	1.14	1.36	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
			(Ma)	±1σ	$^{176}Yb/^{177}Hf$	±1σ	$^{176}Lu/^{177}Hf$	±1σ	$^{176}Hf/^{177}Hf$	±1σ			(Ma)	(Ma)	
		DDK26-14	824		0.076389	0.001227	0.001378	0.000004	0.282473	0.000014	6.90	0.50	1.11	1.29	
		DDK26-15	807		0.035745	0.000424	0.000705	0.000002	0.282475	0.000015	6.96	0.53	1.09	1.27	
		DDK26-16	763		0.082371	0.002138	0.001566	0.000059	0.282488	0.000016	6.02	0.55	1.10	1.30	
		DDK26-17	810		0.070728	0.001077	0.001372	0.000014	0.282458	0.000015	6.04	0.53	1.13	1.33	
		DDK26-18	813		0.081995	0.001113	0.001547	0.000005	0.282450	0.000015	5.76	0.51	1.15	1.35	
		DDK26-19	808		0.062658	0.001558	0.001241	0.000042	0.282444	0.000014	5.60	0.48	1.15	1.36	
		DDK26-20	755		0.069880	0.001684	0.001339	0.000014	0.282462	0.000014	5.05	0.50	1.13	1.35	
		DDK26-21	811		0.153811	0.000683	0.002890	0.000031	0.282542	0.000014	8.23	0.51	1.06	1.19	
		DDK26-22	826		0.077716	0.001271	0.001401	0.000003	0.282466	0.000012	6.66	0.43	1.12	1.30	
		DDK26-23	835		0.060261	0.002093	0.001167	0.000024	0.282493	0.000015	7.96	0.51	1.08	1.23	
		DDK26-24	704		0.046782	0.000915	0.000908	0.000008	0.282449	0.000014	3.68	0.50	1.13	1.40	
		DDK46-1	833		0.049918	0.001564	0.001085	0.000041	0.282464	0.000015	6.94	0.54	1.12	1.29	
		DDK46-2	840		0.153857	0.004843	0.003169	0.000082	0.282522	0.000017	7.94	0.60	1.10	1.23	
		DDK46-3	837		0.056471	0.000590	0.001243	0.000020	0.282489	0.000018	7.82	0.64	1.09	1.24	
		DDK46-4	832		0.058744	0.000761	0.001259	0.000023	0.282487	0.000014	7.63	0.48	1.09	1.25	
		DDK46-5	833		0.072747	0.000830	0.001882	0.000036	0.282446	0.000019	5.82	0.68	1.17	1.36	
		DDK46-6	820		0.026989	0.000606	0.000665	0.000021	0.282453	0.000020	6.48	0.72	1.12	1.31	
		DDK46-7	837		0.040892	0.000558	0.000938	0.000017	0.282434	0.000014	6.05	0.51	1.15	1.35	
		DDK46-8	831		0.055095	0.000406	0.001181	0.000003	0.282483	0.000016	7.51	0.56	1.09	1.25	
		DDK46-9	826		0.041114	0.001770	0.001019	0.000051	0.282425	0.000013	5.44	0.46	1.17	1.38	
		DDK46-10	825		0.172550	0.001909	0.003435	0.000031	0.282552	0.000018	8.57	0.63	1.06	1.18	
		DDK46-11	782		0.024443	0.000433	0.000554	0.000010	0.282457	0.000017	5.85	0.61	1.11	1.32	
		DDK46-12	821		0.185551	0.002877	0.003798	0.000022	0.282589	0.000020	9.60	0.69	1.01	1.11	
		DDK46-13	814		0.085083	0.002309	0.001899	0.000014	0.282443	0.000015	5.31	0.51	1.17	1.38	
		DDK46-14	822		0.067053	0.000945	0.001431	0.000030	0.282467	0.000015	6.61	0.54	1.12	1.31	
		DDK46-15	811		0.029847	0.000317	0.000693	0.000005	0.282432	0.000018	5.51	0.62	1.15	1.37	
		DDK46-16	821		0.071740	0.001814	0.001454	0.000020	0.282483	0.000018	7.13	0.64	1.10	1.27	
		DDK46-17	811		0.069578	0.000640	0.001559	0.000003	0.282422	0.000015	4.71	0.54	1.19	1.42	
		DDK46-18	976		0.123260	0.005704	0.003520	0.000169	0.282468	0.000039	8.59	1.37	1.19	1.30	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
			(Ma)	±1σ	$^{176}Yb/^{177}Hf$	±1σ	$^{176}Lu/^{177}Hf$	±1σ	$^{176}Hf/^{177}Hf$	±1σ			(Ma)	(Ma)	
		DDK46-19	807		0.045571	0.001360	0.001018	0.000008	0.282432	0.000018	5.26	0.65	1.16	1.38	
		DDK46-20	827		0.145267	0.002372	0.002936	0.000065	0.282535	0.000018	8.30	0.63	1.07	1.20	
		DDK46-21	807		0.071742	0.001273	0.001555	0.000040	0.282466	0.000018	6.20	0.61	1.13	1.32	
		DDK46-22	828		0.037933	0.000915	0.000962	0.000015	0.282460	0.000019	6.74	0.66	1.12	1.30	
		DDK46-23	816		0.059873	0.002198	0.001292	0.000054	0.282442	0.000015	5.68	0.53	1.15	1.36	
		DDK46-24	821		0.062930	0.000721	0.001356	0.000004	0.282471	0.000012	6.75	0.43	1.12	1.30	
		DDK46-25	822		0.029156	0.000178	0.000692	0.000003	0.282428	0.000016	5.63	0.56	1.15	1.37	
Shaba intrusions		SB2-1	793		0.023084	0.000313	0.000459	0.000002	0.282495	0.000014	7.49	0.49	1.06	1.23	
		SB2-2	784		0.024253	0.000469	0.000471	0.000005	0.282470	0.000016	6.39	0.55	1.09	1.29	
		SB2-3	785		0.022243	0.000555	0.000430	0.000003	0.282467	0.000013	6.33	0.47	1.09	1.29	
		SB2-4	800		0.037860	0.001079	0.000744	0.000009	0.282495	0.000014	7.48	0.49	1.06	1.23	
		SB2-5	801		0.042892	0.000393	0.000821	0.000009	0.282496	0.000014	7.49	0.50	1.06	1.23	
		SB2-6	805		0.030228	0.000047	0.000592	0.000006	0.282438	0.000015	5.68	0.51	1.14	1.35	
		SB2-7	793		0.023661	0.000318	0.000475	0.000003	0.282463	0.000013	6.35	0.45	1.10	1.30	
		SB2-8	839		0.022857	0.000132	0.000466	0.000005	0.282467	0.000012	7.52	0.41	1.09	1.26	
		SB2-9	791		0.021087	0.001348	0.000415	0.000019	0.282423	0.000013	4.91	0.47	1.15	1.39	
		SB2-10	783		0.034017	0.000192	0.000700	0.000012	0.282462	0.000013	5.97	0.47	1.11	1.32	
		SB2-11	780		0.051751	0.000326	0.000993	0.000006	0.282475	0.000015	6.21	0.54	1.10	1.30	
		SB2-12	781		0.039254	0.000743	0.000758	0.000006	0.282469	0.000016	6.13	0.56	1.10	1.30	
		SB2-13	772		0.047180	0.000293	0.000938	0.000005	0.282481	0.000015	6.28	0.53	1.09	1.29	
		SB2-14	783		0.032745	0.000937	0.000626	0.000007	0.282466	0.000012	6.14	0.42	1.10	1.30	
		SB2-15	788		0.035335	0.000685	0.000697	0.000005	0.282443	0.000013	5.43	0.46	1.13	1.35	
		SB2-16	795		0.023528	0.000495	0.000472	0.000004	0.282434	0.000013	5.37	0.45	1.14	1.36	
		SB2-17	791		0.028451	0.000446	0.000560	0.000005	0.282441	0.000013	5.46	0.46	1.13	1.35	
		SB2-18	801		0.043937	0.000531	0.000873	0.000014	0.282507	0.000016	7.88	0.55	1.05	1.21	
		SB2-19	773		0.032751	0.000269	0.000656	0.000004	0.282496	0.000013	7.00	0.46	1.06	1.24	
		SB2-20	821		0.043691	0.000555	0.000887	0.000005	0.282470	0.000015	6.97	0.53	1.10	1.28	
		SB2-21	786		0.034665	0.000188	0.000673	0.000011	0.282486	0.000013	6.89	0.46	1.07	1.26	
		SB2-22	779		0.052498	0.000176	0.001056	0.000012	0.282499	0.000016	7.00	0.57	1.07	1.25	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
					$^{176}Yb/$		$^{176}Lu/$		$^{176}Hf/$						
			(Ma)	±1σ	^{177}Hf	±1σ	^{177}Hf	±1σ	^{177}Hf	±1σ			(Ma)	(Ma)	
		SB2-23	781		0.039479	0.000353	0.000797	0.000008	0.282457	0.000015	5.71	0.53	1.12	1.33	
		SB2-24	803		0.044077	0.001410	0.000890	0.000020	0.282466	0.000015	6.47	0.52	1.11	1.30	
		SB2-25	782		0.047947	0.000503	0.000952	0.000021	0.282521	0.000014	7.94	0.51	1.03	1.19	
		SB2-26	791		0.071799	0.000526	0.001424	0.000007	0.282471	0.000016	6.08	0.57	1.12	1.31	
		SB2-27	801		0.040870	0.001108	0.000783	0.000008	0.282490	0.000014	7.31	0.50	1.07	1.24	
		SB31-1	802		0.033417	0.000287	0.000647	0.000006	0.282503	0.000014	7.88	0.49	1.05	1.21	
		SB31-2	817		0.020986	0.000552	0.000404	0.000008	0.282494	0.000012	8.00	0.40	1.06	1.21	
		SB31-3	796		0.038673	0.000275	0.000713	0.000009	0.282494	0.000014	7.38	0.48	1.06	1.24	
		SB31-4	795		0.020267	0.000839	0.000391	0.000010	0.282450	0.000014	5.96	0.47	1.12	1.33	
		SB31-5	800		0.038413	0.000275	0.000706	0.000017	0.282512	0.000014	8.10	0.50	1.04	1.19	
		SB31-6	793		0.035152	0.000750	0.000676	0.000008	0.282487	0.000012	7.10	0.41	1.07	1.25	
		SB31-7	794		0.044768	0.001838	0.000764	0.000017	0.282498	0.000013	7.46	0.46	1.06	1.23	
		SB31-8	788		0.036721	0.000699	0.000660	0.000019	0.282531	0.000012	8.54	0.43	1.01	1.15	
		SB31-9	776		0.048313	0.000581	0.000878	0.000005	0.282499	0.000015	7.05	0.53	1.06	1.24	
		SB31-10	786		0.046384	0.000606	0.000805	0.000005	0.282484	0.000015	6.77	0.52	1.08	1.27	
		SB31-11	775		0.020583	0.000127	0.000402	0.000005	0.282476	0.000015	6.44	0.51	1.08	1.28	
		SB31-12	862		0.022027	0.000196	0.000429	0.000003	0.282484	0.000013	8.64	0.44	1.07	1.21	
		SB31-13	775		0.026776	0.000715	0.000497	0.000004	0.282496	0.000016	7.13	0.56	1.05	1.24	
		SB31-14	777		0.023165	0.000683	0.000434	0.000005	0.282499	0.000013	7.30	0.45	1.05	1.23	
		SB31-15	781		0.031125	0.001129	0.000562	0.000007	0.282487	0.000017	6.88	0.59	1.07	1.26	
		SB31-16	787		0.035283	0.001908	0.000674	0.000042	0.282511	0.000013	7.80	0.47	1.04	1.20	
		SB31-17	791		0.049186	0.000701	0.000873	0.000003	0.282517	0.000016	8.01	0.57	1.04	1.19	
		SB31-18	779		0.051258	0.000525	0.000903	0.000004	0.282522	0.000014	7.92	0.50	1.03	1.19	
		SB31-19	796		0.025211	0.000334	0.000469	0.000001	0.282500	0.000016	7.71	0.56	1.05	1.21	
		SB31-20	793		0.035265	0.000885	0.000650	0.000021	0.282499	0.000013	7.54	0.46	1.05	1.22	
		SB31-21	797		0.017796	0.000208	0.000331	0.000002	0.282463	0.000013	6.50	0.46	1.10	1.29	
		SB31-22	781		0.032199	0.001775	0.000571	0.000021	0.282440	0.000015	5.22	0.51	1.13	1.36	
		SB31-23	791		0.033648	0.000229	0.000627	0.000004	0.282477	0.000016	6.72	0.57	1.08	1.27	
		SB31-24	823		0.020684	0.000503	0.000401	0.000004	0.282480	0.000015	7.65	0.53	1.07	1.24	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
			(Ma)	±1σ	$^{176}Yb/^{177}Hf$	±1σ	$^{176}Lu/^{177}Hf$	±1σ	$^{176}Hf/^{177}Hf$	±1σ			(Ma)	(Ma)	
Dajianshan pluton	Biotite Granite	SB31-25	786		0.031456	0.000412	0.000576	0.000002	0.282509	0.000013	7.77	0.45	1.04	1.20	Zhu et al., 2019
		SB31-26	774		0.038155	0.000546	0.000675	0.000002	0.282488	0.000016	6.70	0.56	1.07	1.26	
		SB31-27	812		0.038127	0.001011	0.000676	0.000008	0.282485	0.000013	7.44	0.46	1.08	1.24	
		SB31-28	787		0.044327	0.000620	0.000816	0.000001	0.282513	0.000015	7.80	0.53	1.04	1.20	
		SB31-29	786		0.022205	0.000256	0.000413	0.000008	0.282492	0.000014	7.26	0.50	1.06	1.24	
		DJS2-1	800		0.031271	0.000089	0.001108	0.000003	0.282534	0.000009	8.07	0.29	1.04	1.19	
		DJS2-2	800		0.046562	0.000235	0.001671	0.000010	0.282470	0.000011	5.21	0.39	1.16	1.37	
		DJS2-3	800		0.036813	0.000068	0.001345	0.000003	0.282430	0.000010	4.11	0.36	1.20	1.44	
		DJS2-4	800		0.070869	0.000130	0.002240	0.000005	0.282489	0.000011	5.27	0.40	1.17	1.36	
		DJS2-5	800		0.032548	0.000065	0.001141	0.000003	0.282460	0.000011	5.40	0.37	1.15	1.36	
		DJS2-6	800		0.033897	0.000044	0.001193	0.000002	0.282411	0.000010	3.63	0.33	1.22	1.47	
		DJS2-7	800		0.026908	0.000055	0.000931	0.000002	0.282430	0.000009	4.58	0.31	1.18	1.41	
		DJS2-8	800		0.051382	0.000494	0.001822	0.000018	0.282373	0.000014	1.62	0.49	1.31	1.59	
		DJS2-9	800		0.061319	0.000141	0.001909	0.000004	0.282384	0.000010	1.91	0.35	1.30	1.57	
		DJS2-10	800		0.036007	0.000065	0.001298	0.000003	0.282447	0.000010	4.79	0.35	1.18	1.39	
		DJS2-11	800		0.061119	0.000149	0.001990	0.000005	0.282432	0.000010	3.53	0.36	1.23	1.47	
		DJS2-12	800		0.055801	0.000160	0.001999	0.000005	0.282476	0.000011	5.05	0.40	1.17	1.38	
		DJS2-13	800		0.024941	0.000062	0.000869	0.000002	0.282396	0.000007	3.44	0.25	1.22	1.48	
		DJS2-14	800		0.052439	0.000098	0.001860	0.000004	0.282464	0.000010	4.77	0.35	1.18	1.39	
		DJS2-15	800		0.029585	0.000087	0.001025	0.000003	0.282410	0.000010	3.76	0.34	1.21	1.46	
		DJS2-16	800		0.024414	0.000174	0.000841	0.000006	0.282419	0.000009	4.29	0.31	1.19	1.43	
		DJS2-17	800		0.035372	0.000062	0.001244	0.000003	0.282387	0.000010	2.73	0.34	1.26	1.52	
		DJS2-18	800		0.046972	0.000044	0.001679	0.000002	0.282523	0.000012	7.08	0.42	1.09	1.25	
		DJS2-19	800		0.028718	0.000167	0.000941	0.000005	0.282430	0.000010	4.57	0.33	1.18	1.41	
		DJS2-20	800		0.057188	0.000041	0.002018	0.000002	0.282445	0.000012	3.93	0.41	1.22	1.45	
		DJS2-21	800		0.022838	0.000048	0.000866	0.000002	0.282409	0.000011	3.91	0.38	1.21	1.45	
		DJS2-22	800		0.038764	0.000281	0.001246	0.000009	0.282454	0.000008	5.10	0.28	1.16	1.37	
		DJS2-23	800		0.023426	0.000069	0.000894	0.000003	0.282411	0.000008	3.95	0.28	1.21	1.45	
		DJS2-24	800		0.029992	0.000111	0.001049	0.000005	0.282440	0.000009	4.79	0.31	1.17	1.39	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
			(Ma)	±1σ	$^{176}Yb/^{177}Hf$	±1σ	$^{176}Lu/^{177}Hf$	±1σ	$^{176}Hf/^{177}Hf$	±1σ			(Ma)	(Ma)	
Mopanshan intrusion (782 Ma)	Granite	MPS05-03-02	948	13	0.033300		0.00133		0.282360	0.000014	5.56	0.43	1.27		**Huang et al., 2009**
		MPS05-03-06	862	12	0.020589		0.00083		0.282406	0.000015	5.61	0.51	1.19		
		MPS05-03-07	829	11	0.014710		0.000598		0.282396	0.000012	4.67	0.42	1.20		
		MPS05-03-08	903	12	0.028494		0.001126		0.282361	0.000012	4.75	0.42	1.26		
		MPS05-03-09	893	12	0.033790		0.001255		0.282358	0.000017	4.33	0.59	1.27		
		MPS05-03-11	1051	14	0.026748		0.001077		0.282394	0.000011	9.15	0.37	1.22		
		MPS05-03-14	1157	18	0.024720		0.000997		0.282356	0.000018	10.16	0.64	1.27		
Dajianshan	Granite	DT10-1	841	8	0.021900	0.002000	0.000903	0.000079	0.282425	0.000013	5.82	0.44	1.17	1.37	**Zhao et al., 2021**
		DT10-2	884	70	0.011982	0.000296	0.000504	0.000009	0.282418	0.000016	6.72	0.55	1.16	1.35	
		DT10-3	802	8	0.011955	0.000391	0.000505	0.000014	0.282407	0.000017	4.51	0.58	1.18	1.42	
		DT10-4	819	7	0.014088	0.000077	0.000626	0.000003	0.282413	0.000013	5.04	0.47	1.18	1.40	
		DT10-5	804	7	0.015778	0.000169	0.000732	0.000008	0.282418	0.000015	4.85	0.52	1.17	1.40	
		DT10-6	819	9	0.014341	0.000332	0.000631	0.000013	0.282419	0.000012	5.28	0.41	1.17	1.39	
		DT10-7	799	7	0.009620	0.000040	0.000443	0.000001	0.282405	0.000011	4.42	0.37	1.18	1.43	
		DT10-8	785	8	0.011725	0.000180	0.000513	0.000009	0.282401	0.000012	3.94	0.41	1.19	1.45	
		DT10-9	800	6	0.011197	0.000408	0.000520	0.000019	0.282420	0.000014	4.93	0.48	1.16	1.40	
		DT10-10	800	7	0.014064	0.000113	0.000649	0.000005	0.282412	0.000017	4.56	0.58	1.18	1.42	
		DT10-11	795	7	0.014002	0.000174	0.000632	0.000008	0.282414	0.000016	4.56	0.57	1.17	1.42	
		DT10-12	790	8	0.013829	0.000322	0.000616	0.000012	0.282421	0.000013	4.68	0.45	1.16	1.40	
		DT10-13	798	7	0.019940	0.000202	0.000901	0.000009	0.282431	0.000011	5.08	0.40	1.16	1.39	
		DT10-14	771	8	0.015960	0.000248	0.000661	0.000010	0.282415	0.000011	4.04	0.38	1.17	1.43	
		DT10-15	800	7	0.033204	0.001418	0.001399	0.000058	0.282452	0.000012	5.59	0.42	1.14	1.35	
		DT10-16	693	9	0.022002	0.000522	0.000970	0.000019	0.282429	0.000011	2.70	0.38	1.16	1.46	
		DT10-17	794	7	0.016420	0.000572	0.000726	0.000024	0.282425	0.000015	4.87	0.51	1.16	1.40	
		DT10-18	794	9	0.014473	0.000169	0.000597	0.000006	0.282426	0.000018	4.98	0.62	1.16	1.39	
		DT10-19	797	8	0.022299	0.000256	0.000933	0.000011	0.282415	0.000011	4.47	0.39	1.18	1.42	
		DT10-20	809	7	0.020407	0.000304	0.000909	0.000012	0.282414	0.000012	4.70	0.41	1.18	1.42	
		DT10-21	800	6	0.017453	0.000368	0.000779	0.000017	0.282444	0.000011	5.66	0.39	1.14	1.35	
		DT10-22	797	8	0.026102	0.000505	0.001057	0.000019	0.282450	0.000013	5.65	0.44	1.14	1.35	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
			(Ma)	±1σ	$^{176}Yb/^{177}Hf$	±1σ	$^{176}Lu/^{177}Hf$	±1σ	$^{176}Hf/^{177}Hf$	±1σ			(Ma)	(Ma)	
		DT10-23	785	9	0.014949	0.000599	0.000626	0.000024	0.282426	0.000011	4.78	0.37	1.16	1.39	
		DT10-24	777	11	0.015669	0.000553	0.000657	0.000020	0.282453	0.000012	5.51	0.43	1.12	1.34	
		DT10-25	798	11	0.014365	0.000383	0.000636	0.000017	0.282445	0.000012	5.72	0.42	1.13	1.34	
		DT10-26	816	8	0.019146	0.000398	0.000859	0.000018	0.282433	0.000011	5.57	0.38	1.15	1.37	
		DT10-27	802	8	0.014167	0.000234	0.000582	0.000010	0.282407	0.000010	4.50	0.35	1.18	1.43	
		DT10-28	820	7	0.014917	0.000181	0.000659	0.000009	0.282429	0.000009	5.61	0.33	1.15	1.37	
		DT10-29	800	8	0.009747	0.000095	0.000389	0.000002	0.282427	0.000010	5.23	0.35	1.15	1.38	
		DT10-30	797	10	0.011558	0.000540	0.000461	0.000021	0.282429	0.000010	5.23	0.36	1.15	1.37	
		DT16-1	772	9	0.012213	0.000057	0.000518	0.000002	0.282445	0.000010	5.21	0.37	1.13	1.36	
		DT16-2	775	9	0.011062	0.000114	0.000472	0.000005	0.282442	0.000012	5.17	0.42	1.13	1.36	
		DT16-3	801	8	0.014654	0.000136	0.000610	0.000006	0.282452	0.000011	6.04	0.37	1.12	1.33	
		DT16-4	845	10	0.015537	0.000631	0.000644	0.000025	0.282443	0.000011	6.96	0.33	1.12	1.30	
		DT16-5	804	10	0.008800	0.000126	0.000382	0.000005	0.282447	0.000010	5.77	0.40	1.13	1.35	
		DT16-6	793	10	0.010905	0.000089	0.000467	0.000004	0.282458	0.000010	6.13	0.35	1.11	1.31	
		DT16-7	840	12	0.015943	0.000364	0.000658	0.000013	0.282446	0.000012	6.67	0.43	1.13	1.32	
		DT16-8	799	9	0.010603	0.000167	0.000452	0.000007	0.282422	0.000011	5.02	0.40	1.16	1.39	
		DT16-9	806	10	0.013223	0.000112	0.000556	0.000005	0.282446	0.000012	5.95	0.43	1.13	1.34	
		DT16-10	803	8	0.011874	0.000020	0.000504	0.000001	0.282444	0.000011	5.87	0.39	1.13	1.34	
		DT16-11	804	8	0.011455	0.000113	0.000490	0.000004	0.282451	0.000011	6.14	0.38	1.12	1.32	
		DT16-12	807	9	0.020810	0.000547	0.000855	0.000020	0.282459	0.000012	6.27	0.41	1.12	1.32	
		DT16-13	814	9	0.017417	0.000161	0.000717	0.000006	0.282454	0.000012	6.32	0.41	1.12	1.32	
		DT16-14	803	9	0.010415	0.000167	0.000444	0.000007	0.282455	0.000010	6.29	0.34	1.11	1.31	
		DT16-15	805	8	0.033076	0.000634	0.001359	0.000027	0.282458	0.000012	5.92	0.43	1.14	1.34	
		DT16-16	801	8	0.026649	0.000191	0.001083	0.000008	0.282455	0.000013	5.90	0.47	1.13	1.34	
		DT16-17	799	9	0.010561	0.000206	0.000451	0.000008	0.282442	0.000009	5.73	0.33	1.13	1.34	
		DT16-18	799	10	0.011670	0.000254	0.000496	0.000010	0.282425	0.000010	5.10	0.33	1.15	1.38	
		DT16-19	794	8	0.011620	0.000103	0.000496	0.000004	0.282443	0.000009	5.64	0.32	1.13	1.35	
		DT16-20	807	7	0.017848	0.000620	0.000731	0.000023	0.282435	0.000011	5.52	0.40	1.15	1.36	
		DT16-21	859	11	0.011249	0.000155	0.000482	0.000006	0.282446	0.000009	7.17	0.31	1.13	1.30	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
			(Ma)	±1σ	$^{176}Yb/^{177}Hf$	±1σ	$^{176}Lu/^{177}Hf$	±1σ	$^{176}Hf/^{177}Hf$	±1σ			(Ma)	(Ma)	
Dajianshan pluton		DT16-22	855	13	0.013407	0.000045	0.000561	0.000002	0.282459	0.000012	7.50	0.43	1.11	1.27	
		DT16-23	802	10	0.012262	0.000137	0.000520	0.000006	0.282446	0.000010	5.91	0.36	1.13	1.34	
		DT16-24	799	9	0.011032	0.000046	0.000472	0.000002	0.282442	0.000010	5.70	0.36	1.13	1.35	
		DT16-25	807	10	0.011426	0.000066	0.000494	0.000002	0.282447	0.000010	6.05	0.35	1.12	1.33	
		DJS11-1	820	10	0.012400	0.000149	0.000567	0.000009	0.282450	0.000014	6.41	0.49	1.12	1.32	
		DJS11-2	803	8	0.026933	0.001124	0.001215	0.000049	0.282453	0.000011	5.80	0.39	1.14	1.34	
		DJS11-3	805	8	0.011830	0.000148	0.000578	0.000008	0.282453	0.000010	6.19	0.35	1.12	1.32	
		DJS11-4	806	8	0.018489	0.000528	0.000869	0.000024	0.282460	0.000012	6.31	0.43	1.12	1.31	
		DJS11-5	802	9	0.011593	0.000132	0.000525	0.000005	0.282442	0.000013	5.76	0.44	1.13	1.34	
		DJS11-6	802	8	0.019833	0.000513	0.000943	0.000023	0.282449	0.000011	5.78	0.39	1.13	1.34	
		DJS11-7	797	9	0.013789	0.000431	0.000635	0.000020	0.282453	0.000014	5.98	0.48	1.12	1.33	
		DJS11-8	792	9	0.005646	0.000110	0.000304	0.000006	0.282436	0.000013	5.46	0.46	1.13	1.36	
		DJS11-9	800	7	0.020438	0.000497	0.000924	0.000023	0.282457	0.000012	6.00	0.42	1.12	1.33	
		DJS11-10	805	7	0.014847	0.000477	0.000671	0.000025	0.282448	0.000013	5.95	0.45	1.13	1.33	
		DJS11-11	803	7	0.026645	0.000764	0.001179	0.000031	0.282466	0.000014	6.27	0.47	1.12	1.31	
		DJS11-12	779	7	0.021326	0.000147	0.000991	0.000006	0.282442	0.000013	5.00	0.44	1.15	1.38	
		DJS11-13	793	9	0.013865	0.000200	0.000661	0.000009	0.282463	0.000011	6.22	0.38	1.11	1.31	
		DJS11-14	783	10	0.013728	0.000406	0.00064	0.000019	0.28246	0.000014	5.92	0.48	1.11	1.32	
		DJS11-15	792	9	0.01137	0.000103	0.000509	0.000005	0.282442	0.000010	5.53	0.34	1.13	1.35	
		DJS11-16	801	8	0.028026	0.000688	0.001286	0.000027	0.282452	0.000010	5.67	0.36	1.14	1.35	
		DJS11-17	807	7	0.012506	0.000064	0.000586	0.000003	0.282451	0.000010	6.15	0.36	1.12	1.32	
		DJS11-18	805	9	0.011363	0.000055	0.0005	0.000003	0.28244	0.000011	5.77	0.37	1.13	1.35	
		DJS11-19	811	10	0.012547	0.000064	0.000555	0.000003	0.282453	0.000013	6.33	0.47	1.12	1.32	
		DJS11-20	781	7	0.024924	0.000625	0.001165	0.000027	0.282475	0.000014	6.14	0.50	1.10	1.30	
		DJS11-21	794	8	0.012702	0.000588	0.00058	0.000026	0.282445	0.000012	5.65	0.44	1.13	1.35	
		DJS11-22	803	8	0.017679	0.000243	0.000778	0.000011	0.28244	0.000015	5.58	0.51	1.14	1.36	
		DJS11-23	799	8	0.012202	0.000126	0.000536	0.000005	0.282441	0.000012	5.63	0.42	1.13	1.35	
		DJS11-24	799	6	0.017935	0.000339	0.000854	0.000018	0.282447	0.000011	5.67	0.39	1.14	1.35	
		DJS11-25	785	7	0.014724	0.000051	0.000681	0.000002	0.282431	0.000012	4.91	0.43	1.15	1.39	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
			(Ma)	±1σ	$^{176}Yb/^{177}Hf$	±1σ	$^{176}Lu/^{177}Hf$	±1σ	$^{176}Hf/^{177}Hf$	±1σ			(Ma)	(Ma)	
		DJS11-26	787	10	0.012204	0.000143	0.000523	0.000006	0.282439	0.000012	5.32	0.43	1.14	1.36	
		DJS11-27	801	10	0.013161	0.000941	0.00056	0.000037	0.282426	0.000011	5.15	0.39	1.15	1.38	
		DJS11-28	795	10	0.014594	0.000183	0.000646	0.000008	0.282424	0.000012	4.89	0.43	1.16	1.40	
		DJS12-1	796	6	0.023634	0.000362	0.001114	0.000014	0.282444	0.000014	5.39	0.51	1.15	1.36	
		DJS12-2	800	8	0.013281	0.000081	0.000617	0.000004	0.282423	0.000011	4.99	0.38	1.16	1.39	
		DJS12-3	804	7	0.026724	0.000750	0.001157	0.000030	0.282444	0.000011	5.53	0.37	1.15	1.36	
		DJS12-4	802	7	0.014493	0.000193	0.000704	0.000009	0.282444	0.000011	5.71	0.40	1.13	1.35	
		DJS12-5	805	9	0.017544	0.000348	0.00082	0.000014	0.28248	0.000012	7.00	0.44	1.09	1.27	
		DJS12-6	809	8	0.013092	0.000084	0.000636	0.000004	0.282439	0.000010	5.75	0.35	1.14	1.35	
		DJS12-7	797	9	0.011609	0.000345	0.000518	0.000015	0.28244	0.000010	5.57	0.36	1.13	1.35	
		DJS12-8	803	7	0.016069	0.000177	0.000782	0.000008	0.282446	0.000011	5.76	0.38	1.13	1.35	
		DJS12-9	797	8	0.019609	0.000947	0.000896	0.000043	0.282448	0.000012	5.67	0.43	1.13	1.35	
		DJS12-10	809	7	0.020276	0.000530	0.000937	0.000024	0.282436	0.000014	5.47	0.49	1.15	1.37	
		DJS12-11	797	18	0.026781	0.000445	0.001188	0.000018	0.282455	0.000012	5.74	0.43	1.13	1.34	
		DJS12-12	807	8	0.009463	0.000058	0.000447	0.000002	0.282419	0.000010	5.07	0.36	1.16	1.39	
		DJS12-13	804	8	0.025226	0.000552	0.001185	0.000024	0.282438	0.000013	5.31	0.44	1.16	1.38	
		DJS12-14	796	7	0.016501	0.000586	0.00075	0.000028	0.282423	0.000010	4.85	0.35	1.16	1.40	
		DJS12-15	810	7	0.008457	0.000093	0.00042	0.000004	0.282434	0.000010	5.71	0.35	1.14	1.35	
		DJS12-16	802	6	0.021063	0.000113	0.00098	0.000006	0.282428	0.000010	5.00	0.36	1.17	1.39	
		DJS12-17	796	6	0.021504	0.000428	0.00101	0.000021	0.282442	0.000010	5.37	0.37	1.15	1.37	
		DJS12-18	800	7	0.016658	0.000142	0.000762	0.000008	0.282446	0.000011	5.72	0.38	1.13	1.35	
		DJS12-19	800	7	0.016704	0.000299	0.000821	0.000015	0.282447	0.000010	5.74	0.35	1.13	1.34	
		DJS12-20	801	8	0.016984	0.000074	0.000756	0.000004	0.282421	0.000012	4.87	0.43	1.17	1.40	
		DJS12-21	796	8	0.010421	0.000131	0.000498	0.000007	0.28245	0.000010	5.91	0.36	1.12	1.33	
		DJS12-22	743	9	0.014869	0.000242	0.000662	0.000011	0.282417	0.000011	3.50	0.39	1.17	1.44	
		DJS12-23	775	12	0.01307	0.000274	0.0006	0.000012	0.282448	0.000011	5.33	0.39	1.13	1.35	
		DJS12-24	770	10	0.016083	0.000136	0.000755	0.000008	0.282448	0.000009	5.13	0.33	1.13	1.36	
		DJS12-25	751	10	0.008996	0.000225	0.000433	0.000011	0.282416	0.000008	3.77	0.29	1.16	1.43	
		DJS12-26	797	10	0.02132	0.000164	0.000918	0.000007	0.282439	0.000010	5.35	0.35	1.15	1.37	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
			(Ma)	±1σ	$^{176}Yb/^{177}Hf$	±1σ	$^{176}Lu/^{177}Hf$	±1σ	$^{176}Hf/^{177}Hf$	±1σ			(Ma)	(Ma)	
Mopanshan pluton		DJS12-27	806	10	0.016313	0.000214	0.000714	0.000009	0.282435	0.000010	5.48	0.35	1.15	1.37	
		DJS12-28	816	10	0.02436	0.000455	0.001161	0.000022	0.282445	0.000010	5.84	0.37	1.15	1.35	
		DJS12-29	800	7	0.020435	0.000342	0.000898	0.000015	0.282434	0.000011	5.23	0.37	1.15	1.38	
		DJS12-30	799	7	0.012348	0.000383	0.000584	0.000016	0.282431	0.000012	5.26	0.41	1.15	1.37	
		MPS1-1	799	6	0.026638	0.000337	0.001201	0.000014	0.282448	0.000013	5.53	0.47	1.14	1.36	
		MPS1-2	781	8	0.037254	0.000554	0.001539	0.000021	0.282419	0.000013	3.96	0.47	1.20	1.44	
		MPS1-3	778	9	0.016453	0.000439	0.000758	0.000019	0.282465	0.000014	5.94	0.50	1.11	1.31	
		MPS1-4	774	15	0.02786	0.000462	0.001197	0.000021	0.282442	0.000013	4.78	0.45	1.15	1.39	
		MPS1-5	777	8	0.037799	0.000358	0.001744	0.000016	0.282486	0.000013	6.12	0.44	1.11	1.30	
		MPS1-6	781	11	0.03495	0.000746	0.001457	0.000031	0.282428	0.000013	4.30	0.45	1.18	1.42	
		MPS1-7	772	10	0.019432	0.000405	0.000829	0.000016	0.282442	0.000017	4.93	0.60	1.14	1.37	
		MPS1-8	736	11	0.029456	0.000345	0.001218	0.000015	0.282441	0.000012	3.91	0.43	1.15	1.41	
		MPS1-9	736	8	0.033411	0.000525	0.001349	0.000018	0.282453	0.000013	4.28	0.46	1.14	1.39	
		MPS1-10	739	8	0.026955	0.000700	0.001088	0.000026	0.282445	0.000013	4.21	0.47	1.14	1.40	
		MPS1-11	779	8	0.029267	0.000253	0.001261	0.000013	0.282458	0.000014	5.44	0.48	1.13	1.35	
		MPS1-12	779	12	0.03733	0.000246	0.001565	0.000009	0.282419	0.000015	3.90	0.53	1.20	1.45	
		MPS1-13	775	23	0.032093	0.000802	0.001335	0.000032	0.282433	0.000013	4.41	0.45	1.17	1.41	
		MPS1-14	783	7	0.030628	0.000950	0.001244	0.000034	0.282444	0.000011	5.05	0.37	1.15	1.38	
		MPS1-15	843	9	0.022873	0.000344	0.000975	0.000014	0.282439	0.000011	6.28	0.40	1.15	1.34	
		MPS1-16	792	7	0.0181	0.000462	0.000697	0.000015	0.282432	0.000010	5.07	0.37	1.15	1.38	
		MPS1-17	782	7	0.017667	0.000394	0.000769	0.000016	0.282454	0.000012	5.60	0.43	1.12	1.34	
		MPS1-18	783	6	0.024451	0.000529	0.000986	0.000019	0.282425	0.000014	4.49	0.49	1.17	1.41	
		MPS1-19	807	7	0.022457	0.000318	0.000967	0.000011	0.282431	0.000015	5.23	0.54	1.16	1.38	
		MPS1-20	784	8	0.03286	0.000732	0.001376	0.000028	0.282434	0.000015	4.65	0.53	1.17	1.40	
		MPS1-21	885	13	0.0536	0.001059	0.002181	0.000043	0.282412	0.000018	5.54	0.62	1.23	1.42	
		MPS1-22	797	8	0.029686	0.000324	0.001234	0.000013	0.282431	0.000013	4.88	0.47	1.17	1.40	
		MPS1-23	780	12	0.027542	0.000535	0.001136	0.000022	0.282439	0.000013	4.84	0.45	1.15	1.39	
		MPS1-24	784	11	0.026281	0.001126	0.001064	0.000045	0.282423	0.000013	4.42	0.45	1.17	1.42	
		MPS1-25	781	7	0.027436	0.000723	0.001157	0.000028	0.282435	0.000013	4.70	0.47	1.16	1.40	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
			(Ma)	±1σ	$^{176}Yb/^{177}Hf$	±1σ	$^{176}Lu/^{177}Hf$	±1σ	$^{176}Hf/^{177}Hf$	±1σ			(Ma)	(Ma)	
		MPS1-26	806	8	0.007994	0.000224	0.000369	0.000009	0.282442	0.000011	5.93	0.40	1.13	1.34	
		MPS1-27	774	6	0.03543	0.000978	0.001598	0.000048	0.282476	0.000012	5.82	0.44	1.12	1.32	
		MPS1-28	810	17	0.008391	0.000345	0.000385	0.000011	0.282403	0.000011	4.60	0.38	1.18	1.42	
		MPS2-1	780	7	0.021833	0.000398	0.000955	0.000014	0.282449	0.000015	5.30	0.53	1.14	1.36	
		MPS2-2	771	7	0.026453	0.000302	0.001128	0.000011	0.282442	0.000012	4.77	0.40	1.15	1.38	
		MPS2-3	761	7	0.030606	0.000624	0.001341	0.000028	0.282463	0.000013	5.19	0.44	1.13	1.35	
		MPS2-4	777	6	0.025979	0.000154	0.001101	0.000007	0.282433	0.000011	4.60	0.37	1.16	1.40	
		MPS2-5	808	7	0.025495	0.000470	0.001004	0.000019	0.282328	0.000015	1.60	0.51	1.31	1.62	
		MPS2-6	782	6	0.03133	0.001083	0.001241	0.000032	0.28243	0.000013	4.54	0.45	1.17	1.41	
		MPS2-7	783	6	0.031398	0.000592	0.001322	0.000021	0.282403	0.000011	3.56	0.40	1.21	1.47	
		MPS2-8	779	7	0.028134	0.000269	0.001214	0.000012	0.282438	0.000014	4.75	0.51	1.16	1.39	
		MPS2-9	787	8	0.019948	0.000372	0.000921	0.000018	0.282457	0.000012	5.74	0.41	1.12	1.33	
		MPS2-10	779	7	0.025257	0.001845	0.001144	0.000086	0.282455	0.000013	5.38	0.44	1.13	1.35	
		MPS2-11	781	8	0.027802	0.001065	0.001168	0.000038	0.28244	0.000016	4.90	0.55	1.15	1.38	
		MPS2-12	776	7	0.019062	0.000222	0.00082	0.000009	0.282412	0.000013	3.98	0.44	1.18	1.44	
		MPS2-13	772	7	0.018494	0.000587	0.000793	0.000023	0.282419	0.000012	4.15	0.43	1.17	1.42	
		MPS2-14	870	12	0.028459	0.002173	0.001191	0.000090	0.282426	0.000014	6.30	0.50	1.17	1.36	
		MPS2-15	785	7	0.024302	0.000322	0.001043	0.000013	0.282434	0.000011	4.84	0.39	1.16	1.39	
		MPS2-16	780	6	0.028627	0.000635	0.001188	0.000023	0.282434	0.000013	4.65	0.46	1.16	1.40	
		MPS2-17	783	6	0.032474	0.000436	0.001375	0.000017	0.282412	0.000013	3.83	0.45	1.20	1.45	
		MPS2-18	781	6	0.029402	0.000704	0.001242	0.000032	0.282421	0.000011	4.15	0.40	1.18	1.43	
		MPS2-19	781	6	0.026459	0.000860	0.001164	0.000043	0.282432	0.000012	4.62	0.42	1.16	1.40	
		MPS2-20	823	7	0.025564	0.000538	0.001048	0.000021	0.282436	0.000013	5.71	0.46	1.16	1.36	
		MPS2-21	790	7	0.031537	0.000829	0.001261	0.000034	0.282425	0.000013	4.49	0.45	1.18	1.42	
		MPS2-22	780	7	0.033038	0.001946	0.001379	0.000078	0.282453	0.000012	5.24	0.43	1.14	1.36	
		MPS2-23	779	8	0.018528	0.000426	0.000782	0.000017	0.282419	0.000012	4.32	0.42	1.17	1.42	
		MPS2-24	779	6	0.028653	0.000651	0.00118	0.000027	0.282327	0.000015	0.83	0.54	1.31	1.64	
Xuelongbao pluton		XLB4-1	750	10	0.007407	0.000103	0.00035	0.000006	0.282559	0.000013	8.83	0.47	0.97	1.11	
		XLB4-2	743	6	0.019828	0.000555	0.000944	0.000027	0.28258	0.000013	9.12	0.45	0.95	1.08	

Table S4: The isotope results for the Neoproterozoic mafic and adakitic pluton in the western margin of the Yangtze Block

Locality	Rock type	Spot	Best age		Isotopic ratio						εHf	±1σ	T_{DM1}	T_{DM2}	Reference
					$^{176}Yb/^{177}Hf$	±1σ	$^{176}Lu/^{177}Hf$	±1σ	$^{176}Hf/^{177}Hf$	±1σ			(Ma)	(Ma)	
			(Ma)	±1σ											
		XLB4-3	776	10	0.012378	0.000070	0.000564	0.000004	0.28257	0.000013	9.70	0.46	0.95	1.07	
		XLB4-4	734	8	0.013973	0.000341	0.00063	0.000017	0.282576	0.000012	8.98	0.44	0.95	1.09	
		XLB4-5	730	8	0.006858	0.000062	0.000323	0.000002	0.28255	0.000012	8.11	0.43	0.98	1.14	
		XLB4-6	746	10	0.009716	0.000197	0.000452	0.000008	0.282563	0.000012	8.84	0.42	0.96	1.10	
		XLB4-7	757	9	0.019158	0.000271	0.000889	0.000011	0.282579	0.000012	9.46	0.41	0.95	1.07	
		XLB4-8	766	11	0.022602	0.001030	0.00104	0.000048	0.282571	0.000015	9.25	0.53	0.97	1.09	
		XLB4-9	742	10	0.011295	0.000261	0.000525	0.000012	0.28258	0.000016	9.34	0.54	0.94	1.07	
		XLB4-10	745	9	0.01417	0.000356	0.000627	0.000014	0.282553	0.000016	8.40	0.56	0.98	1.13	
		XLB4-11	751	9	0.021	0.000129	0.000924	0.000006	0.282554	0.000014	8.42	0.48	0.99	1.13	
		XLB4-12	746	9	0.012589	0.000297	0.000569	0.000014	0.282559	0.000014	8.64	0.49	0.97	1.12	
		XLB4-13	729	9	0.020003	0.000560	0.000891	0.000025	0.282585	0.000015	9.06	0.53	0.94	1.08	
		XLB4-14	733	10	0.010286	0.000698	0.000485	0.000032	0.282573	0.000012	8.88	0.42	0.95	1.09	
		XLB4-15	743	8	0.015105	0.000409	0.000677	0.000017	0.282565	0.000013	8.74	0.45	0.97	1.11	
		XLB4-16	740	9	0.013738	0.000442	0.000615	0.000019	0.282556	0.000012	8.40	0.42	0.98	1.13	
		XLB4-17	745	9	0.009884	0.000205	0.000459	0.000009	0.282559	0.000011	8.70	0.40	0.97	1.11	
		XLB4-18	739	9	0.008854	0.000130	0.000418	0.000006	0.28258	0.000013	9.33	0.45	0.94	1.07	
		XLB4-19	741	8	0.013768	0.000104	0.000672	0.000005	0.282577	0.000012	9.14	0.41	0.95	1.08	
		XLB4-20	740	10	0.009198	0.000155	0.000433	0.000007	0.282557	0.000013	8.52	0.46	0.97	1.12	
		XLB4-21	752	8	0.014483	0.000441	0.000695	0.000020	0.282551	0.000013	8.45	0.46	0.98	1.13	
		XLB4-22	763	11	0.010363	0.000063	0.00048	0.000003	0.282564	0.000012	9.25	0.41	0.96	1.09	
		XLB4-23	740	7	0.023718	0.001106	0.001043	0.000046	0.282567	0.000012	8.58	0.41	0.97	1.12	
		XLB4-24	754	9	0.00826	0.000303	0.000389	0.000013	0.28257	0.000013	9.30	0.45	0.95	1.08	
		XLB4-25	769	11	0.01621	0.000087	0.00075	0.000005	0.282576	0.000013	9.66	0.46	0.95	1.07	
		XLB4-26	859	17	0.013985	0.000402	0.000646	0.000018	0.282568	0.000017	11.41	0.58	0.96	1.03	
		XLB4-27	791	10	0.010904	0.000284	0.000505	0.000011	0.282562	0.000012	9.76	0.42	0.97	1.08	
		XLB4-28	778	5	0.013027	0.000622	0.000607	0.000031	0.282575	0.000012	9.90	0.43	0.95	1.06	
		XLB4-29	778	9	0.009111	0.000052	0.000423	0.000002	0.282565	0.000012	9.62	0.43	0.96	1.08	
		XLB4-30	774	9	0.019257	0.000351	0.000877	0.000016	0.282576	0.000013	9.71	0.47	0.95	1.07	