Supplementary Material for Slab tear along a subducting passive margin and related Late Triassic E-MORB/OIB-affinity magmatism in southeastern Tibet

Wan-Li, Tang [1, 2, 3], Jian-Lin, Chen[1, 2*], Tian-Nan, Yang[4*], An Yin[5], Ji-Feng, Xu[6] and Jiang-Bo, Ren[1, 2]

[1] *State Key Laboratory of Isotope Geochemistry, Guangzhou Institute of Geochemistry, Chinese Academy of Sciences, Guangzhou 510640, China*

[2] *CAS Center for Excellence in Deep Earth Science, Guangzhou 510640, China*

[3] *University of Chinese Academy of Sciences, Beijing 100039, China*

[4] *Institute of Geology, Chinese Academy of Geological Sciences, Beijing 100037, China*

[5] *Department of Earth, Planetary, and Space Sciences, University of California, Los Angeles, California 90095-1567, USA*

[6] *State Key Laboratory of Geological Processes and Mineral Resources, University of Geosciences, Beijing 100083, China*

Contents of this file

1. TABLES

Table DR1. SHRIMP zircon U–Pb data for the Late Triassic volcanics in the Yushu-Yidun Arc.

Table DR2. Major and trace elemental abundances and Sr–Nd isotopic compositions of the Late Triassic volcanics in the Yushu-Yidun Arc.

Table DR3. Calculated primary melt compositions and thermal parameters for the Late Triassic basalts of the Yushu-Yidun Arc.

Table DR4. Age data of mineralization-related porphyry intrusions and volcanics across the Yushu-Yidun Arc

2. FIGURES

Figures DR1. Sm/Nd vs. Lu/Hf for the Yushu-Yidun Arc volcanics.

Figures DR2. Nb/Zr vs. Th/Zr for the Yushu-Yidun Arc volcanics.

Figures DR3. Temperatures and pressures calculated for the Yushu-Yidun Arc basalts.

3. REFERENCE CITED

Table DR1. SHRIMP zircon U–Pb data for the Late Triassic volcanics in the Yushu-Yidun Arc.

Spots	Th(ppm)	U(ppm)	Th/U	Isotopic ratios						Isotopic age (Ma)					
				$^{207}Pb/^{206}Pb$	±% 1σ	$^{207}Pb/^{235}U$	1σ	$^{206}Pb/^{238}U$	±% 1σ	$^{207}Pb/^{206}Pb$	±% 1σ	$^{207}Pb/^{235}U$	±% 1σ	$^{206}Pb/^{238}U$	±% 1σ
Basalts, weighted mean age = 213.9 ± 3.6 Ma (MSWD = 2.3, N = 20)															
10NRH-05-01	303	347	2.82	0.0491	0.0174	0.2230	0.0764	0.0326	0.0031	154	680	204	63.5	207	19.1
10NRH-05-02	252	336	3.45	0.0518	0.0150	0.2255	0.0627	0.0316	0.0025	280	553	207	52.0	200	15.3
10NRH-05-03	1047	702	4.41	0.0500	0.0113	0.2194	0.0478	0.0317	0.0019	195	455	201	39.8	201	11.9
10NRH-05-04	355	329	5.71	0.0517	0.0090	0.2181	0.0363	0.0311	0.0015	333	294	200	30.3	197	9.08
10NRH-05-05	271	349	8.16	0.0505	0.0062	0.2185	0.0256	0.0315	0.0010	217	263	201	21.4	200	6.15
10NRH-05-06	238	330	12.9	0.0501	0.0039	0.2181	0.0167	0.0315	0.0006	211	181	200	13.9	200	3.69
10NRH-05-07	209	296	10.8	0.0510	0.0047	0.2375	0.0222	0.0338	0.0007	239	215	216	18.2	214	4.65
10NRH-05-08	409	397	12.2	0.0503	0.0041	0.2268	0.0182	0.0327	0.0007	206	6.48	208	15.1	207	4.19
10NRH-05-09	185	255	10.7	0.0513	0.0048	0.2450	0.0246	0.0346	0.0010	254	210	222	20.0	219	6.28
10NRH-05-10	381	383	13.7	0.0511	0.0037	0.2438	0.0178	0.0345	0.0007	256	164	222	14.5	219	4.56
10NRH-05-11	311	339	13.9	0.0530	0.0038	0.2551	0.0183	0.0350	0.0009	328	160	231	14.8	222	5.32
10NRH-05-12	305	352	12.2	0.0505	0.0042	0.2301	0.0181	0.0334	0.0007	220	191	210	15.0	212	4.08
10NRH-05-13	243	274	11.4	0.0509	0.0045	0.2367	0.0196	0.0341	0.0007	235	208	216	16.1	216	4.59
10NRH-05-14	345	371	12.1	0.0506	0.0042	0.2471	0.0203	0.0353	0.0007	220	223	224	16.5	224	4.55
10NRH-05-15	210	284	11.2	0.0534	0.0048	0.2586	0.0218	0.0356	0.0008	346	204	234	17.6	226	5.28
10NRH-05-16	263	327	11.9	0.0508	0.0043	0.2358	0.0191	0.0337	0.0008	232	190	215	15.7	214	4.70
10NRH-05-17	320	319	12.1	0.0513	0.0042	0.2418	0.0196	0.0341	0.0007	254	191	220	16.0	216	4.36
10NRH-05-18	458	400	14.5	0.0552	0.0038	0.2596	0.0190	0.0339	0.0007	417	154	234	15.3	215	4.51
10NRH-05-19	386	439	12.6	0.0528	0.0042	0.2493	0.0187	0.0345	0.0007	320	184	226	15.2	218	4.14
10NRH-05-20	297	314	10.5	0.0524	0.0050	0.2490	0.0238	0.0341	0.0007	306	218	226	19.3	216	4.38
Andesite, weighted mean age = 216.2 ± 1.6 Ma (MSWD = 0.46, N = 20)															

10NRH-09-01	469	494	0.95	0.0482	0.0028	0.2243	0.0130	0.0337	0.0006	109	130	205	10.8	214	3.57
10NRH-09-02	700	640	1.09	0.0510	0.0027	0.2398	0.0130	0.0341	0.0006	243	125	218	10.6	216	3.79
10NRH-09-03	782	863	0.91	0.0502	0.0025	0.2363	0.0117	0.0340	0.0005	211	115	215	9.59	216	2.91
10NRH-09-04	404	495	0.82	0.0487	0.0024	0.2289	0.0114	0.0339	0.0005	200	121	209	9.45	215	3.34
10NRH-09-05	178	291	0.61	0.0497	0.0031	0.2317	0.0143	0.0339	0.0007	189	144	212	11.8	215	4.59
10NRH-09-06	349	427	0.82	0.0504	0.0028	0.2351	0.0130	0.0337	0.0005	217	131	214	10.7	214	2.98
10NRH-09-07	308	434	0.71	0.0482	0.0027	0.2284	0.0121	0.0346	0.0006	109	126	209	10.0	219	3.97
10NRH-09-08	678	771	0.88	0.0509	0.0026	0.2370	0.0126	0.0336	0.0005	235	112	216	10.3	213	3.30
10NRH-09-09	487	471	1.03	0.0491	0.0029	0.2278	0.0140	0.0337	0.0006	154	141	208	11.6	213	3.47
10NRH-09-10	361	379	0.95	0.0514	0.0031	0.2413	0.0142	0.0342	0.0006	257	132	219	11.6	217	3.88
10NRH-09-11	290	375	0.77	0.0510	0.0037	0.2375	0.0173	0.0339	0.0007	239	168	216	14.2	215	4.29
10NRH-09-12	195	288	0.68	0.0480	0.0037	0.2297	0.0178	0.0346	0.0006	98.2	235	210	14.7	219	3.61
10NRH-09-13	481	644	0.75	0.0503	0.0027	0.2352	0.0125	0.0341	0.0007	209	126	214	10.3	216	4.12
10NRH-09-14	347	488	0.71	0.0470	0.0029	0.2175	0.0133	0.0336	0.0006	55.7	131	200	11.1	213	3.96
10NRH-09-15	211	274	0.77	0.0517	0.0034	0.2418	0.0157	0.0341	0.0007	272	147	220	12.8	216	4.47
10NRH-09-16	484	678	0.71	0.0482	0.0028	0.2289	0.0133	0.0344	0.0007	122	133	209	11.0	218	4.32
10NRH-09-17	542	722	0.75	0.0460	0.0022	0.2210	0.0107	0.0343	0.0004	-	-	203	8.90	218	2.76
10NRH-09-18	386	581	0.66	0.0454	0.0023	0.2204	0.0116	0.0347	0.0005	-	-	202	9.63	220	3.40
10NRH-09-19	258	366	0.70	0.0458	0.0022	0.2178	0.0098	0.0342	0.0006	-	-	200	8.19	217	3.52
10NRH-09-20	364	502	0.73	0.0453	0.0018	0.2216	0.0101	0.0348	0.0005	-	-	203	8.36	221	3.16
Andesite, weighted mean age = 217.3 ± 2.8 Ma (MSWD = 1.5, N = 17)															
10NRH-38-01	517	468	15.2	0.0531	0.0035	0.2506	0.0167	0.0341	0.0007	345	150	227	13.6	216	4.20
10NRH-38-02	250	253	13.2	0.0551	0.0042	0.2581	0.0186	0.0341	0.0006	417	169	233	15.1	216	4.03
10NRH-38-03	169	135	10.1	0.0573	0.0057	0.2629	0.0252	0.0341	0.0009	502	188	237	20.2	216	5.62
10NRH-38-04	274	288	14.1	0.0467	0.0033	0.2216	0.0166	0.0341	0.0006	35.3	159	203	13.8	216	3.70
10NRH-38-05	164	167	12.3	0.0500	0.0041	0.2426	0.0215	0.0357	0.0009	195	178	221	17.6	226	5.55
10NRH-38-06	351	239	13.6	0.0526	0.0039	0.2503	0.0174	0.0351	0.0006	322	136	227	14.1	223	3.90

10NRH-38-07	128	112	9.57	0.0563	0.0059	0.2512	0.0261	0.0342	0.0011	465	233	228	21.2	217	7.02
10NRH-38-08	236	262	13.1	0.0603	0.0046	0.2807	0.0198	0.0345	0.0007	617	167	251	15.7	219	4.49
10NRH-38-09	150	186	10.6	0.0602	0.0057	0.2746	0.0253	0.0339	0.0008	609	405	246	20.2	215	4.97
10NRH-38-10	242	189	12.1	0.0524	0.0043	0.2455	0.0192	0.0347	0.0008	302	189	223	15.7	220	4.80
10NRH-38-11	169	157	9.63	0.0526	0.0055	0.2460	0.0241	0.0351	0.0008	309	239	223	19.6	222	5.21
10NRH-38-12	500	320	11.8	0.0501	0.0042	0.2337	0.0196	0.0340	0.0006	198	189	213	16.2	216	3.82
10NRH-38-13	216	204	10.5	0.0462	0.0044	0.2377	0.0246	0.0367	0.0009	5.66	215	217	20.2	232	5.41
10NRH-38-14	501	309	14.9	0.0505	0.0034	0.2314	0.0161	0.0327	0.0006	217	156	211	13.3	207	3.71
10NRH-38-15	201	183	10.1	0.0463	0.0046	0.2153	0.0207	0.0340	0.0006	13.1	222	198	17.3	215	3.85
10NRH-38-16	262	200	12.5	0.0527	0.0042	0.2435	0.0175	0.0345	0.0008	322	183	221	14.3	219	4.74
10NRH-38-17	297	215	9.10	0.0504	0.0055	0.2229	0.0214	0.0331	0.0008	213	237	204	17.8	210	4.72

Table DR2. Major and trace elemental abundances and Sr–Nd isotopic compositions of the Late Triassic volcanics in the Yushu-Yidun Arc.

	Xiaxiaoliu basalts (E-MORB-like)			Pulang basalts (OIB-like)			Pulang andesites		
	11XXL-1	10XXL-3	10XXL-12	10NRH-01	10NRH-04	10NRH-08	10NRH-06	10NRH-13	10NRH-15
Major oxides (wt.%)									
SiO_2	42.5	45.6	45.6	49.2	44.0	48.7	58.8	61.5	61.2
TiO_2	3.24	2.55	2.26	2.18	2.04	2.92	0.70	0.67	0.67
Al_2O_3	13.1	16.4	13.4	16.2	16.9	17.4	15.5	14.6	14.9
FeO^T	18.8	16.6	14.0	14.8	11.5	14.2	5.33	4.76	4.59
MnO	0.26	0.18	0.24	0.11	0.21	0.17	0.09	0.12	0.06
MgO	6.59	6.81	6.99	5.15	7.68	2.10	3.11	3.54	3.45
CaO	6.09	1.22	10.2	1.41	5.22	1.31	4.13	3.29	3.22
Na_2O	3.77	3.49	2.30	4.97	2.34	5.30	3.79	3.15	3.63
K_2O	0.05	0.13	0.13	0.13	0.89	1.73	2.52	3.41	3.05
P_2O_5	0.31	0.28	0.27	0.61	0.37	0.52	0.41	0.33	0.33
LOI	2.97	4.66	2.64	3.20	7.70	3.69	4.82	3.61	4.11
Total	99.8	99.8	99.6	99.6	100	99.7	99.8	99.6	99.7
$Mg^{\#}$	42.3	46.2	51.2	42.2	58.4	23.6	55.0	60.9	61.2
Trace elements (ppm)									
Sc	60.5	38.1	38.5	26.0	33.2	38.0	16.0	17.2	15.7
V	470	419	398	186	282	105	146	138	124
Cr	84.2	100	115	105	72.7	51.1	66.8	68.9	68.7
Co	79.9	57.1	52.5	48.5	46.9	36.7	16.5	14.4	9.66
Ni	95.3	88.3	80.7	66.8	75.1	40.9	14.1	13.0	11.5
Rb	1.20	4.60	2.30	4.96	45.3	298	69.3	60.8	50.0
Sr	245	118	573	332	214	197	881	533	680
Y	40.0	28.4	33.5	36.6	28.3	46.9	14.4	13.8	13.6

Zr	194	153	137	174	136	273	172	200	146
Nb	18.8	16.4	15.5	25.4	20.9	41.8	9.03	13.7	14.1
Ba	48.0	41.0	73.0	102	149	923	4033	1962	2087
La	21.0	16.2	15.7	22.9	19.8	34.9	32.5	50.6	51.1
Ce	48.5	34.7	35.0	46.6	40.9	73.3	60.2	89.0	89.7
Pr	6.90	4.80	5.00	5.97	5.42	9.13	7.30	9.75	9.73
Nd	31.0	20.8	22.1	24.6	22.9	36.8	27.3	33.5	33.3
Sm	7.80	5.10	5.70	5.79	5.59	8.61	5.22	5.44	5.37
Eu	2.42	1.66	1.85	1.94	1.93	3.19	1.54	1.58	1.42
Gd	8.66	5.21	6.20	6.25	5.82	9.00	4.63	4.80	4.87
Tb	1.48	0.90	1.08	1.08	0.95	1.51	0.59	0.58	0.57
Dy	9.11	5.71	6.61	6.81	5.70	9.13	2.94	2.76	2.69
Ho	1.81	1.21	1.39	1.46	1.15	1.85	0.56	0.51	0.49
Er	4.77	3.24	3.71	3.96	3.03	4.90	1.47	1.38	1.35
Tm	0.67	0.47	0.53	0.57	0.43	0.71	0.22	0.20	0.20
Yb	4.03	2.99	3.24	3.64	2.69	4.39	1.44	1.31	1.32
Lu	0.65	0.46	0.49	0.55	0.40	0.67	0.22	0.21	0.20
Hf	5.06	3.94	3.66	4.06	3.32	6.41	4.49	5.10	4.00
Ta	1.22	1.07	1.03	1.33	1.10	2.39	0.70	0.98	1.01
Pb	0.70	9.80	6.10	2.46	2.72	9.02	23.1	10.9	15.7
Th	2.10	1.60	1.60	2.94	2.37	5.41	12.4	18.4	18.4
U	0.42	0.27	0.31	0.40	0.46	0.61	2.78	3.87	4.10
Sr-Nd isotopic compositions									
$^{87}Sr/^{86}Sr$	0.706203	0.705801	0.706303	0.706427	0.707285	0.716063	0.706492	0.706905	0.706499
±2σ	0.000005	0.000006	0.000004	0.000005	0.000004	0.000004	0.000006	0.000004	0.000005
$^{87}Sr/^{86}Sr_{(i)}$	0.706158	0.705466	0.706265	0.706299	0.705469	0.703089	0.705817	0.705926	0.705870
$^{143}Nd/^{144}Nd$	0.512807	0.512899	0.512701	0.512805	0.512819	0.512830	0.512427	0.512410	0.512402

±2σ	0.000010	0.000008	0.000009	0.000007	0.000009	0.000007	0.000007	0.000008	0.000008
$^{143}Nd/^{144}Nd_{(t)}$	0.512581	0.512684	0.512474	0.512600	0.512607	0.512627	0.512260	0.512268	0.512260
εNd(t)	4.32	6.34	2.23	4.69	4.82	5.21	-1.93	-1.79	-1.95
T_{DM}(Ga)	0.91	0.62	1.27	0.76	0.80	0.70	1.15	0.99	1.00

Table DR2 (continued)

Pluton Sample					PA				
	10NRH-20	10NRH-22	10NRH-23	10NRH-26	10NRH-28	10NRH-30	10NRH-31	10NRH-35	10NRH-37
Major oxides (wt.%)									
SiO_2	55.0	52.6	56.8	54.7	56.3	56.3	61.5	59.2	52.1
TiO_2	0.96	1.29	1.15	1.65	1.18	1.18	1.08	1.16	1.17
Al_2O_3	15.3	16.7	14.1	15.8	15.6	17.4	14.6	15.9	21.2
FeO^T	7.11	7.13	7.52	7.85	7.37	7.48	6.78	7.08	10.3
MnO	0.10	0.09	0.12	0.09	0.12	0.06	0.07	0.06	0.20
MgO	3.24	4.27	4.99	4.46	4.78	3.88	3.19	4.77	3.93
CaO	5.00	4.36	6.77	3.78	5.29	1.68	4.82	1.94	0.58
Na_2O	4.16	3.05	2.97	2.98	3.28	6.87	3.95	2.71	1.53
K_2O	3.60	3.35	2.65	5.63	2.50	1.18	0.68	2.40	3.07
P_2O_5	0.34	0.35	0.27	0.35	0.35	0.39	0.33	0.27	0.26
LOI	4.17	5.90	1.40	1.28	1.88	2.37	1.76	3.42	4.31
Total	99.7	99.9	99.6	99.5	99.5	99.6	99.6	99.7	99.8
$Mg^{\#}$	48.9	55.7	58.2	54.3	57.6	52.1	49.7	58.6	44.4
Trace elements (ppm)									
Sc	20.8	21.9	28.4	25.9	22.8	23.7	25.0	26.8	23.4
V	156	222	231	227	208	230	223	245	195
Cr	89.1	55.9	103	85.1	110	92.8	106	76.1	62.2

Co	19.0	20.8	24.2	23.1	22.2	19.1	17.2	21.0	27.1
Ni	18.6	23.0	31.3	24.6	22.4	17.0	23.0	22.7	24.3
Rb	56.6	99.8	66.2	129	71.1	21.4	22.3	65.2	79.4
Sr	1116	648	1484	932	1249	946	1510	666	590
Y	16.4	17.2	19.4	22.9	19.9	18.7	22.1	19.4	13.4
Zr	170	208	164	219	210	202	157	169	268
Nb	12.3	16.3	12.4	17.9	16.8	14.3	11.4	13.2	18.8
Ba	5773	1795	2325	8669	2693	954	1444	3029	4315
La	47.8	47.7	40.8	45.4	56.1	53.7	44.9	46.1	21.6
Ce	89.0	86.6	75.3	88.2	101	101	86.5	89.8	48.4
Pr	10.3	9.94	8.90	10.8	11.7	11.6	10.6	10.6	5.54
Nd	37.2	35.4	33.7	40.7	42.0	42.0	40.2	38.5	21.2
Sm	6.58	6.21	6.10	7.83	7.22	7.36	7.55	6.92	4.37
Eu	1.96	1.78	1.79	2.52	2.09	1.96	2.08	2.01	1.59
Gd	5.67	5.45	5.16	7.25	6.33	6.11	6.86	6.38	3.87
Tb	0.70	0.71	0.69	0.92	0.81	0.78	0.90	0.82	0.50
Dy	3.38	3.56	3.76	4.77	4.06	3.78	4.52	4.07	2.63
Ho	0.62	0.67	0.69	0.90	0.77	0.69	0.83	0.73	0.52
Er	1.63	1.80	1.89	2.34	2.04	1.89	2.15	1.95	1.53
Tm	0.23	0.26	0.26	0.32	0.28	0.26	0.29	0.27	0.22
Yb	1.48	1.62	1.67	2.03	1.91	1.69	1.85	1.67	1.47
Lu	0.23	0.24	0.25	0.30	0.28	0.26	0.27	0.24	0.23
Hf	4.48	5.37	4.30	5.70	5.36	5.31	4.19	4.43	6.86
Ta	0.83	1.14	0.84	1.22	1.08	0.97	0.77	0.88	1.29
Pb	23.7	22.3	34.6	22.7	31.9	27.6	37.8	14.0	12.9
Th	12.5	14.4	10.7	10.9	14.1	15.3	11.4	12.7	24.0
U	2.57	2.51	2.34	3.44	2.89	3.25	2.43	2.84	2.85

Sr-Nd isotopic compositions									
$^{87}Sr/^{86}Sr$	0.706321	0.707022	0.706203	0.706902	0.706281	0.706048	0.705800	0.706608	0.707173
±2σ	0.000004	0.000004	0.000003	0.000004	0.000003	0.000002	0.000003	0.000006	0.000003
$^{87}Sr/^{86}Sr_{(i)}$	0.705886	0.705701	0.705817	0.705715	0.705792	0.705854	0.705673	0.705768	0.706019
$^{143}Nd/^{144}Nd$	0.512400	0.512434	0.512399	0.512454	0.512454	0.512391	0.512402	0.512436	0.512455
±2σ	0.000009	0.000007	0.000009	0.000007	0.000008	0.000008	0.000007	0.000007	0.000009
$^{143}Nd/^{144}Nd_{(t)}$	0.512250	0.512282	0.512244	0.512287	0.512305	0.512239	0.512237	0.512280	0.512276
εNd(t)	-2.22	-1.53	-2.27	-1.43	-1.08	-2.37	-2.41	-1.56	-1.64
T_{DM}(Ga)	1.09	1.03	1.11	1.12	0.99	1.10	1.17	1.06	1.22

FeO^T = Total FeO content; $Mg^\#$ = 100×Mg^{2+}/(Mg^{2+}+Fe^{2+})

Table DR3. Calculated primary melt compositions and thermal parameters for the Late Triassic basalts of the Yushu-Yidun Arc.

Sample	11XXL-1	10XXL-12	10NRH-04	10XXL-10	10XXL-11	10XXL-18
	This study			Literature data		
Olivine addition (%)	5.26	27.2	4.64	4.66	27.1	5.33
wt.%						
SiO_2	43.9	45.5	47.4	49.0	45.9	47.0
TiO_2	3.21	1.81	2.12	2.05	1.88	2.40
Al_2O_3	13.0	10.7	17.5	14.3	10.6	14.0
Cr_2O_3	0.01	0.02	0.01	0.01	0.02	0.01
FeO^T	19.9	15.0	12.6	12.1	15.2	14.1
MnO	0.27	0.25	0.23	0.20	0.26	0.22
MgO	8.34	15.8	9.91	9.45	15.4	8.97
CaO	6.03	8.14	5.42	7.54	7.43	9.93
Na_2O	3.73	1.82	2.43	4.31	2.30	2.27
K_2O	0.05	0.10	0.92	0.18	0.06	0.14
H_2O	0.96	0.55	0.85	0.50	0.57	0.56
T	1843	1619	1505	1498	1624	1602
Tp	1219	1480	1294	1274	1469	1251
Gpa	10.3	4.16	2.80	2.77	4.25	3.89

T represents melting temperature; Tp represents mantle potential temperature. Literature data are from Chen et al. (2016).

Table DR4. Age data of mineralization-related porphyry intrusions and volcanics across the Yushu-Yidun Arc

Location	Lithology	Methodology	Age (Ma)	Date Source
Porphyries				
Sucuoma	Granite	LA-ICP-MS U–Pb	235 ± 2	Wu et al. (2017)
Ganluogou	Ferrodiorite	LA-ICP-MS U–Pb	213 ± 2	Wu et al. (2016)
Ganluogou	Diorite	LA-ICP-MS U–Pb	209 ± 2	Wu et al. (2016)
Ajiseduo	Granite	LA-ICP-MS U–Pb	224 ± 2	Wu et al. (2017)
Jiaduocuo	Granite	LA-ICP-MS U–Pb	218 ± 1	Wu et al. (2017)
Shaluli	Granite	LA-ICP-MS U–Pb	219 ± 1	Wu et al. (2017)
Dongcuo	Monzogranite	LA-ICP-MS U–Pb	206.1 ± 1	Zhu et al. (2019)
Dongcuo	Granite	LA-ICP-MS U–Pb	216.6 ± 0.8	Peng et al. (2014)
Dongcuo	Granite	LA-ICP-MS U–Pb	214.7 ± 2.6	Peng et al. (2014)
Dongcuo	Granite	LA-ICP-MS U–Pb	223.9 ± 3.9	Peng et al. (2014)
Dongcuo	Granite	LA-ICP-MS U–Pb	216.9 ± 0.8	Peng et al. (2014)
Dongcuo	Granite	LA-ICP-MS U–Pb	215.0 ± 1.5	He et al. (2013)
Dongcuo	Granite	LA-ICP-MS U–Pb	216.0 ± 0.7	He et al. (2013)
Dongcuo	Granodiorite	LA-ICP-MS U–Pb	222 ± 2	Wu et al. (2017)
Dongcuo	Granite	SHRIMP U–Pb	224 ± 3	S. W. Liu et al. (2006)
Maxionggou	Granodiorite	LA-ICP-MS U–Pb	216.0 ± 2.2	He et al. (2013)
Maxionggou	Granodiorite	LA-ICP-MS U–Pb	225 ± 2	Wu et al. (2017)
Shengmu	Granite	LA-ICP-MS U–Pb	218.3 ± 3.1	Wu et al. (2017)
Shengmu	Granite	LA-ICP-MS U–Pb	216.1 ± 2.5	Wu et al. (2017)
Shengmu	Granodiorite	LA-ICP-MS U–Pb	220 ± 2	Wu et al. (2017)
Xiangcheng	Porphyry	SHRIMP U–Pb	222 ± 3	S. W. Liu et al. (2006)
Songnuo	Quartz monzonite	SHRIMP U–Pb	220.9 ± 3.5	Leng et al. (2008)
Songnuo	Quartz monzonite	LA-ICP-MS U–Pb	204.7 ± 1.4	X. L. Liu et al. (2016)
Zhuoma	Quartz monzonite	LA-ICP-MS U–Pb	218.9 ± 0.6	X. L. Liu et al. (2016)
Pulang	Quartz monzonite	SHRIMP U–Pb	226.3 ± 2.8	X. S. Wang et al. (2008)
Pulang	Quartz monzonite	SHRIMP U–Pb	228.3 ± 3.0	X. S. Wang et al. (2008)
Pulang	Quartz monzonite	SHRIMP U–Pb	226.0 ± 3.0	X. S. Wang et al. (2008)
Pulang	Quartz diorite	LA-ICP-MS U–Pb	224.2 ± 1.7	B. Q. Wang et al. (2011)
Pulang	Quartz diorite	LA-ICP-MS U–Pb	217.9 ± 1.8	B. Q. Wang et al. (2011)
Pulang	Diorite porphyry	LA-ICP-MS U–Pb	216.6 ± 1.6	Cao et al. (2018)

Pulang	Quartz diorite	LA-ICP-MS U–Pb	217.2 ± 1.4	Chen et al. (2014)
Pulang	Quartz diorite	LA-ICP-MS U–Pb	215.3 ± 1.4	Chen et al. (2014)
Pulang	Quartz diorite	LA-ICP-MS U–Pb	211.8 ± 1.9	Chen et al. (2014)
Pulang	Monzodiorite	LA-ICP-MS U–Pb	215.9 ± 1.3	Leng et al. (2018)
Pulang	Quartz diorite	LA-ICP-MS U–Pb	217.1 ± 1.8	Leng et al. (2018)
Pulang	Quartz diorite	LA-ICP-MS U–Pb	215.1 ± 1.3	Leng et al. (2018)
Pulang	Granodiorite	LA-ICP-MS U–Pb	214.2 ± 1.7	Leng et al. (2018)
Pulang	Quartz diorite	LA-ICP-MS U–Pb	216.1 ± 1.7	Leng et al. (2018)
Pulang	Quartz diorite	LA-ICP-MS U–Pb	216.8 ± 1.4	Leng et al. (2018)
Pulang	Quartz diorite	LA-ICP-MS U–Pb	216.9 ± 2.0	Leng et al. (2018)
Pulang	Andesite porphyry	LA-ICP-MS U–Pb	212.3 ± 1.3	Leng et al. (2018)
Pulang	Quartz diorite	LA-ICP-MS U–Pb	219.6 ± 3.5	X. L. Liu et al. (2013)
Pulang	Quartz monzonite	LA-ICP-MS U-Pb	212.8 ± 1.9	X. L. Liu et al. (2013)
Qiansui	Quartz diorite	LA-ICP-MS U-Pb	217.1 ± 1.5	Ren et al. (2011)
Hongshan	Quartz diorite	LA-ICP-MS U-Pb	216.1 ± 3.2	Huang et al. (2012)
Xuejiping	Quartz diorite	SHRIMP U–Pb	215.3 ± 2.3	Lin and Xia (2006)
Xuejiping	Quartz diorite	LA-ICP-MS U–Pb	217.9 ± 1.8	B. Q. Wang et al. (2011)
Xuejiping	Quartz monzonite	LA-ICP-MS U–Pb	213.4 ± 1.5	Ren et al. (2011)
Xuejiping	Quartz monzonite	SIMS U-Pb	218.5 ± 1.6	Leng et al. (2012)
Xuejiping	Quartz monzonite	LA-ICP-MS U–Pb	215.9 ± 1.4	Chen et al. (2014)
Xuejiping	Diorite	LA-ICP-MS U–Pb	216.9 ± 1.4	Peng et al. (2014)
Xuejiping	Diorite	LA-ICP-MS U–Pb	214.7 ± 2.5	Peng et al. (2014)
Xuejiping	Diorite	LA-ICP-MS U–Pb	216.3 ± 3.4	Peng et al. (2014)
Xuejiping	Diorite	LA-ICP-MS U–Pb	216.8 ± 0.9	Peng et al. (2014)
Chundou	Quartz monzonite	LA-ICP-MS U–Pb	215.3 ± 2.7	Chen et al. (2014)
Chundou	Quartz monzonite	LA-ICP-MS U–Pb	213.1 ± 1.5	Chen et al. (2014)
Pingdong	Quartz diorite	LA-ICP-MS U–Pb	230.3 ± 1.7	B. Q. Wang et al. (2011)
Yaza	Quartz monzonite	LA-ICP-MS U–Pb	227.5 ± 3.5	P. Wang et al. (2017)
Yaza	Quartz monzonite	LA-ICP-MS U–Pb	222.7 ± 3.1	P. Wang et al. (2017)
Shajue	Quartz monzonite	LA-ICP-MS U–Pb	222.5 ± 3.9	P. Wang et al. (2017)
A1	Quartz monzonite	LA-ICP-MS U–Pb	230.0 ± 4.0	P. Wang et al. (2017)
Disuga	Quartz diorite	LA-ICP-MS U–Pb	219.8 ± 3.0	B. Q. Wang et al. (2011)
Bengge	Biotite syenite	LA-ICP-MS U–Pb	213.8 ± 2.2	Jiang et al. (2015)
Bengge	Biotite syenite	LA-ICP-MS U–Pb	219.1 ± 4.7	Jiang et al. (2015)
Lannitang	Quartz monzonite	LA-ICP-MS U–Pb	216.7 ± 1.2	Chen et al. (2014)

Volcanics				
Gacun	Andesite	LA-ICP-MS U–Pb	230.6 ± 1.3	B. Q. Wang et al. (2013)
Gacun	Rhyolite	LA-ICP-MS U–Pb	230 ± 2.5	B. Q. Wang et al. (2013)
Xiangcheng	Andesite	LA-ICP-MS U–Pb	227.9 ± 1.5	B. Q. Wang et al. (2013)
Hongshan	Andesite	LA-ICP-MS U–Pb	213.4 ± 2.2	Y. S. Liu et al. (2010)
Hongshan	Andesite	LA-ICP-MS U–Pb	213.4 ± 1.5	Chen et al. (2014)
Hongniu	Andesite	LA-ICP-MS U–Pb	219.1 ± 3.2	Leng et al. (2014)
Disuga	Andesite	LA-ICP-MS U–Pb	219.8 ± 1.9	Leng et al. (2014)
Disuga	Andesite	LA-ICP-MS U–Pb	220.8 ± 5.3	Leng et al. (2014)
Disuga	Andesite	LA-ICP-MS U–Pb	218.1 ± 4.8	Leng et al. (2014)
Disuga	Andesite	LA-ICP-MS U–Pb	220.7 ± 2.0	B. Q. Wang et al. (2011)
Xuejiping	Andesite	SIMS U-Pb	218.5 ± 1.6	Leng et al. (2012)
Geza	Andesite	LA-ICP-MS U–Pb	212.6 ± 2.8	Dai et al. (2017)
Geza	Andesite	LA-ICP-MS U–Pb	214.5 ± 1.6	Dai et al. (2017)
Xiangcheng	Andesite	LA-ICP-MS U–Pb	227.9 ± 1.5	B. Q. Wang et al. (2013)
Xiaxialiu	Basalt	SIMS U-Pb	216.1 ± 2.8	Chen et al. (2016)
Disuga	Basalt	SIMS U-Pb	213.9 ± 3.6	This study
Disuga	Andesite	SIMS U-Pb	216.3 ± 1.5	This study
Disuga	Andesite	SIMS U-Pb	217.3 ± 2.8	This study

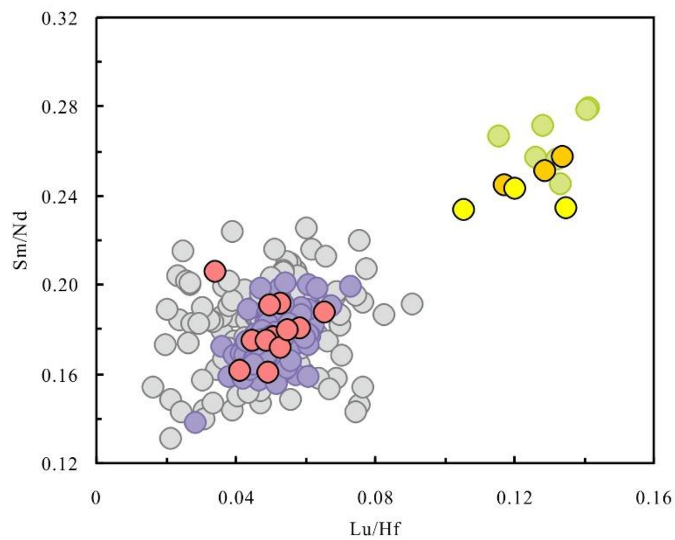

Figure DR1. Sm/Nd vs. Lu/Hf for the Yushu-Yidun Arc volcanics. Data sources and symbols are as in Figure 5.

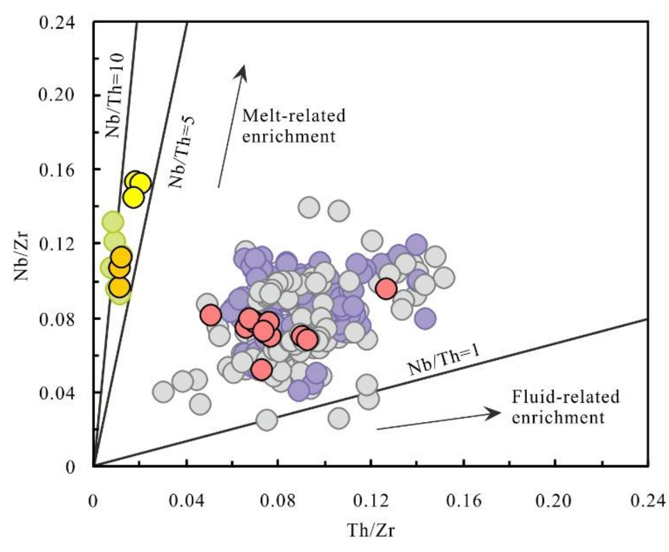

Figure DR2. Nb/Zr vs. Th/Zr for the Yushu-Yidun Arc volcanics. Data sources and symbols are as in Figure 5.

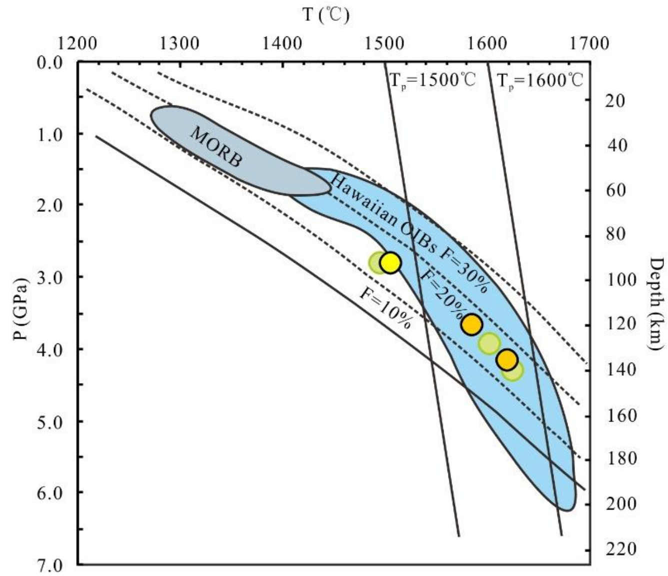

Figure DR3. Temperatures and pressures calculated for the Yushu-Yidun Arc basalts. Lherzolite solidus and melt fraction isopleths are from Katz et al. (2003). MORB and Hawaiian OIBs are from Lee et al. (2009); Data sources and symbols are as in Figure 5.

REFERENCES CITED

Cao, K., Yang, Z. M., Xu, J. F., Fu, B., Li, W. K., and Sun, M. Y., 2018, Origin of dioritic magma and its contribution to porphyry Cu–Au mineralization at Pulang in the Yidun arc, eastern Tibet: Lithos, v. 304, p. 436-449, doi:10.1016/j.lithos.2018.02.018.

Chen, J. L., Xu, J. F., Ren, J. B., and Huang, X. X., 2016, Late Triassic E-MORB-like basalts associated with porphyry Cu-deposits in the southern Yidun continental arc, eastern Tibet: Evidence of slab-tear during subduction?: Ore Geology Reviews, v. 90, p. 1054-1062, doi:10.1016/j.oregeorev.2016.12.006.

Chen, J. L., Xu, J. F., Ren, J. B., Huang, X. X., and Wang, B. D., 2014, Geochronology and geochemical characteristics of Late Triassic porphyritic rocks from the Zhongdian arc, eastern Tibet, and their tectonic and metallogenic implications: Gondwana Research, v. 26, no. 2, p. 492-504, doi:10.1016/j.gr.2013.07.022.

Dai, Y. X., Dong, G. C., Jing, G. Q., Li, X. F., Wang, P., He, W. Y., and Zhou, Q., 2017, Zircon U-Pb chronology,geochemical characteristics of Late-Triassic volcanic rocks from Geza of Zhongdian area,Yunnan and their tectonic significance: Acta Petrologica Sinica, v. 33, no. 8, p. 2548-2562.

He, D. F., Zhu, W. G., Zhong, H., Ren, T., Bai, Z. J., and Fan, H. P., 2013, Zircon U-Pb geochronology and elemental and Sr-Nd-Hf isotopic geochemistry of the Daocheng granitic pluton from the Yidun Arc, SW China: Journal of Asian Earth Sciences, v. 67, p. 1-17, doi:10.1016/j.jseaes.2013.02.002.

Huang, X. X., Xu, J. F., Chen, J. L., and Ren, J. B., 2012, Zhongdian island arc Redhill area two intermediate-felsic intrusive rocks in geochronology, geochemistry and causes: Acta Petrologica Sinica, v. 28, no. 5, p. 1493-1506.

Jiang, L. L., Xue, C. D., Hou, Z. Q., and Xiang, K., 2015, Petrogenesis of the Bengge syenites, northwestern Yunnan: Geochemistry, geochronology and Hf isotopes evidence: Acta Petrologica Sinica, v. 31, no. 11, p. 3234-3246.

Katz, R. F., Spiegelman, M., and Langmuir, C. H., 2003, A new parameterization of hydrous mantle melting: Geochemistry, Geophysics, Geosystems, v. 4, no. 9, doi:10.1029/2002GC000433.

Lee, C.-T. A., Luffi, P., Plank, T., Dalton, H., and Leeman, W. P., 2009, Constraints on the depths and temperatures of basaltic magma generation on Earth and other terrestrial planets using new thermobarometers for mafic magmas: Earth and Planetary Science Letters, v. 279, no. 1, p. 20-33, doi:10.1016/j.epsl.2008.12.020.

Leng, C. B., Cooke, D. R., Hou, Z. Q., Evans, N. J., Zhang, X. C., Chen, W. T., Danišík, M., McInnes, B. I. A., and Yang, J. H., 2018, Quantifying Exhumation at the Giant Pulang Porphyry Cu-Au Deposit Using U-Pb-He Dating: Economic Geology, v. 113, no. 5, p. 1077-1092, doi:10.5382/econgeo.2018.4582.

Leng, C. B., Huang, Q. Y., Zhang, X. C., Wang, S. X., Zhong, H., Hu, R. Z., Bi, X. W., Zhu, J. J., and Wang, X. S., 2014, Petrogenesis of the Late Triassic volcanic rocks in the Southern Yidun arc, SW China: Constraints from the geochronology, geochemistry, and Sr–Nd–Pb–Hf isotopes: Lithos, v. 190-191, p. 363-382, doi:10.1016/j.lithos.2013.12.018.

Leng, C. B., Zhang, X. C., Hu, R. Z., Wang, S. X., Zhong, H., Wang, W. Q., and Bi, X. W., 2012, Zircon U–Pb and molybdenite Re–Os geochronology and Sr–Nd–Pb–Hf isotopic constraints on the genesis of the Xuejiping porphyry copper deposit in Zhongdian, Northwest Yunnan, China: Journal of Asian Earth Sciences, v. 60, p. 31-48, doi:10.1016/j.jseaes.2012.07.019.

Leng, C. B., Zhang, X. C., Wang, S. X., Qin, C. J., Gou, T. Z., and Wang, W. Q., 2008, SHRIMP zircon U-Pb dating of the Songnuo ore-hosted porphyry, Zhongdian, northwest Yunnan: Geotectonica Et Metallogenia, v. 32, no. 1, p. 124-130, doi:10.1007/s11442-008-0201-7.

Lin, Q. C., and Xia, B., 2006, Zircon SHRIMP U-Pb dating of the syn-collisional Xuejiping quartz diorite porphyrite in Zhongdian, Yunnan, China, and its geological implications: Geological Bulletin of China, v. 25, no. 1, p. 133-137.

Liu, S. W., Wang, Z. Q., Yan, Q. R., Li, Q. G., Zhang, D. H., Wang, J. G., Yang, B., Gu, L. B., and Zhao, F. S., 2006, Indosinian Tectonic Setting of the Southern Yidun Arc: Constraints from SHRIMP Zircon Chronology and Geochemistry of Dioritic Porphyries and Granites: Acta Geologica Sinica, v. 80, p. 387-399, doi:10.1111/j.1755-6724.2006.tb00256.x.

Liu, X. L., Li, W. C., Yin, G. H., and Zhang, N., 2013, The geochronology, mineralogy and geochemistry study of the Pulang porphyry copper deposits in Geza arc of Yunnan Province: Acta Petrologica Sinica, v. 29, no. 9, p. 3049-3064, doi:10.1086/671395.

Liu, X. L., Li, W. C., and Zhang, N., 2016, Zircon U-Pb age and geochemical characteristics of the quartz monzonite porphyry from the Zhuoma deposit, Yunnan, China: Bulletin of Mineralogy, Petrology and Geochemistry, v. 35, no. 1, p. 109-117.

Liu, Y. S., Gao, S., Hu, Z. C., Gao, C. G., Zong, K. Q., and Wang, D. B., 2010, Continental and Oceanic Crust Recycling-induced Melt–Peridotite Interactions in the Trans-North China Orogen: U–Pb Dating, Hf Isotopes and Trace Elements in Zircons from Mantle Xenoliths: Journal of Petrology, v. 51, no. 51, p. 392–399, doi:10.1093/petrology/egp082.

Peng, T. P., Zhao, G. C., Fan, W. M., Peng, B. X., and Mao, Y. S., 2014, Zircon geochronology and Hf isotopes of Mesozoic intrusive rocks from the Yidun terrane, Eastern Tibetan Plateau:

Petrogenesis and their bearings with Cu mineralization: Journal of Asian Earth Sciences, v. 80, no. 2, p. 18-33, doi:10.1016/j.jseaes.2013.10.028.

Ren, J. B., Xu, J. F., and Chen, J. L., 2011, Zircon geochronology and geological implications of ore-bearing porphyries from Zhongdian arc: Acta Petrologica Sinica, v. 27, no. 9, p. 2591-2599, doi:10.1016/S1002-0160(11)60127-6.

Wang, B. Q., Zhou, M. F., Chen, W. T., Gao, J. F., and Yan, D. P., 2013, Petrogenesis and tectonic implications of the Triassic volcanic rocks in the northern Yidun Terrane, Eastern Tibet: Lithos, v. 175–176, p. 285-301, doi:10.1016/j.lithos.2013.05.013.

Wang, B. Q., Zhou, M. F., Li, J. W., and Yan, D. P., 2011, Late Triassic porphyritic intrusions and associated volcanic rocks from the Shangri-La region, Yidun terrane, Eastern Tibetan Plateau: Adakitic magmatism and porphyry copper mineralization: Lithos, v. 127, no. 1-2, p. 24-38, doi:10.1016/j.lithos.2011.07.028.

Wang, P., Dong, G. C., Santosh, M., Li, X. F., and Dong, M. L., 2017, Triassic ore-bearing and barren porphyries in the Zhongdian Arc of SW China: implications for the subduction of the Palaeo-Tethys Ocean: International Geology Review, v. 59, no. 11, p. 1490-1505, doi:10.1080/00206814.2017.1285256.

Wang, X. S., Zhang, X. C., Leng, C. B., Qin, C. J., Ma, D. Y., and Wang, W. Q., 2008, Zircon SHRIMP U-Pb dating of the Pulang porphyry copper deposit, northwestern Yunnan, China: The ore-forming time limitation and geological significance: Acta Petrologica Sinica, v. 24, no. 10, p. 2313-2321, doi:10.1016/j.sedgeo.2008.08.001.

Wu, T., Xiao, L., Wilde, S. A., Ma, C. Q., Li, Z. L., Sun, Y., and Zhan, Q. Y., 2016, Zircon U–Pb age and Sr–Nd–Hf isotope geochemistry of the Ganluogou dioritic complex in the northern Triassic Yidun arc belt, Eastern Tibetan Plateau: Implications for the closure of the Garzê-Litang Ocean: Lithos, v. 248-251, p. 94-108, doi:10.1016/j.lithos.2015.12.029.

Wu, T., Xiao, L., Wilde, S. A., Ma, C. Q., and Zhou, J. X., 2017, A mixed source for the Late Triassic Garzê-Daocheng granitic belt and its implications for the tectonic evolution of the Yidun arc belt, eastern Tibetan Plateau: Lithos, v. 288-289, p. 214-230, doi:10.1016/j.lithos.2017.07.002.

Zhu, Y., Lai, S. C., Qin, J. F., Zhang, Z. Z., and Zhang, F. Y., 2019, Late Triassic Biotite Monzogranite from the Western Litang Area, Yidun Terrane, SW China: Petrogenesis and Tectonic Implications: Acta Geologica Sinica, doi:10.1111/(ISSN)1755-6724.