Supporting Information for "The paleogeography of Laurentia in its early years: new constraints from the Paleoproterozoic East Central Minnesota batholith"

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ID-TIMS U-Pb zircon geochronology methods

U-Pb dates were obtained by chemical abrasion isotope dilution thermal ionization mass spectrometry (ID-TIMS) in the Boise State University (BSU) Isotope Geology Laboratory (Table DR1; Fig. SI2). Chemical abrasion of single zircon grains was modified after Mattinson (2005). Zircons were separated from rocks using standard techniques, annealed in a muffle furnace at 900°C for 60 hours in quartz crucibles, and imaged by cathodoluminescence in grain mounts (Fig. SI1).

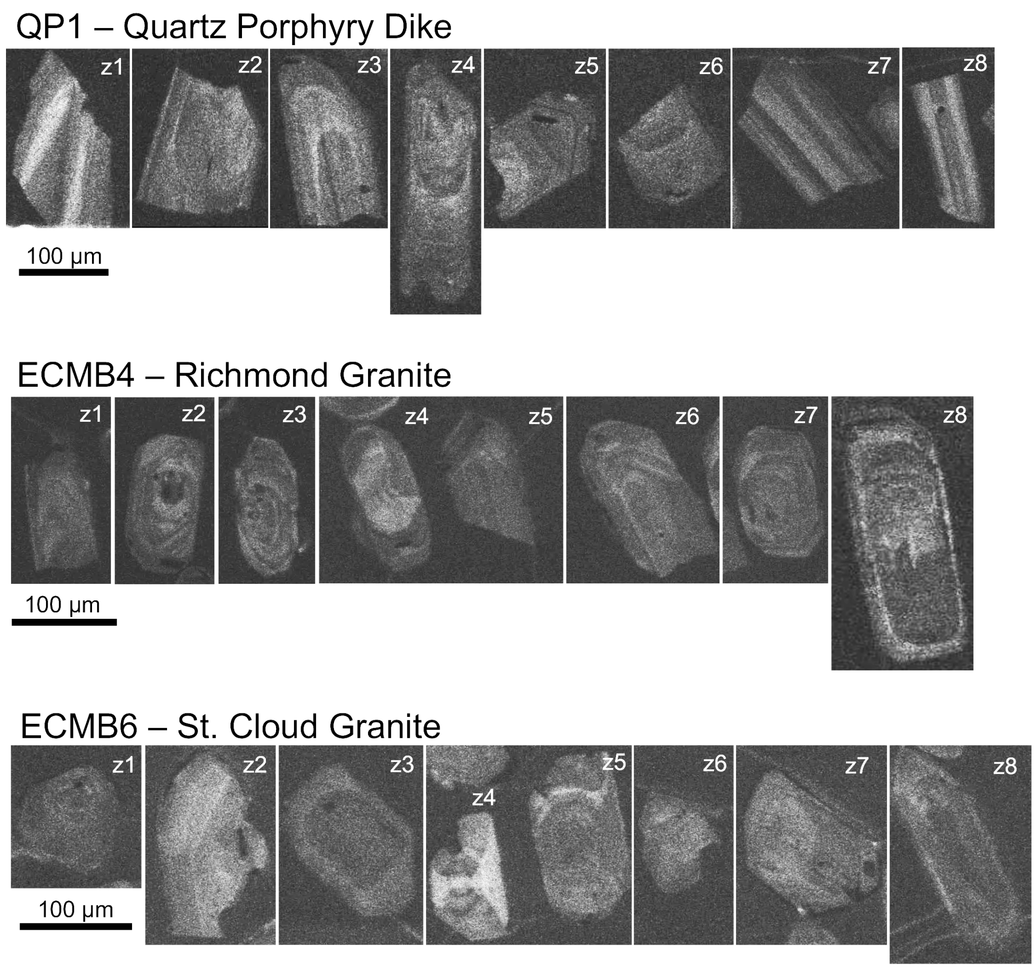

Figure SI1. Cathodoluminescence (CL) images of the zircons dated by ID-TIMS. The 100 μm scale bars applies for all imaged grains in a given sample.

Individual zircons were removed from grain mounts and chemically abraded. Chemical abrasion was carried out by transferring zircons to 3 ml Teflon Perfluoroalkoxy alkane (PFA) beakers in which they were rinsed in 3.5 M HNO_3 and ultrapure H_2O prior to loading into 300 μl Teflon PFA microcapsules. Fifteen microcapsules were placed in a large-capacity Parr vessel and the zircon partially dissolved in 120 μl of 29 M HF for 12 hours at 190°C. Zircons were returned to 3 ml Teflon PFA beakers, HF was removed, and zircons were immersed in 3.5 M HNO_3, ultrasonically cleaned for an hour, and fluxed on a hotplate at 80°C for an hour. The HNO_3 was removed and zircon was rinsed twice in ultrapure H2O before being reloaded into the 300 μl Teflon PFA microcapsules (rinsed and fluxed in 6 M HCl during sonication and washing of the zircons) and spiked with the ^{233}U-^{235}U-^{205}Pb BSU tracer solution (BSU1B). Zircons were dissolved in Parr vessels in 120 μl of 29 M HF at 220°C for 48 hours, dried to fluorides, and re-dissolved in 6 M HCl at 180°C overnight. Pb and U were separated from the zircon matrix using an HCl-based anion-exchange chromatographic procedure (Krogh, 1973), eluted together and dried with 2 μl of 0.05 N H_3PO_4.

Pb and U were loaded on a single outgassed Re filament in 5 μl of a silica-gel/phosphoric acid mixture (Gerstenberger and Haase, 1997), and Pb and U isotopic measurements made on a GV Isoprobe-T multicollector thermal ionization mass spectrometer equipped with an ion-counting Daly detector. Pb isotopes were measured by peak-jumping all isotopes on the Daly detector for 190 cycles with a mass bias correction of 0.16 $\pm$ 0.03%/a.m.u. (1σ). Transitory isobaric interferences due to high-molecular weight organics, particularly on ^{204}Pb and ^{207}Pb, disappeared within 30-45 cycles, while ionization efficiency averaged 104 cps/pg of each Pb isotope. Linearity (to $\geq$1.4 x 10^6 cps) and the associated deadtime correction of the Daly detector were determined by analysis of NBS982. Uranium was analyzed as UO_2^+ ions in static Faraday mode on 10^{12} ohm resistors for up to 300 cycles, and corrected for isobaric interference of $^{233}U^{18}O^{16}O$ on $^{235}U^{16}O^{16}O$ with an $^{18}O/^{16}O$ of 0.00206. Ionization efficiency averaged 20 mV/ng of each U isotope. U mass fractionation was corrected using the $^{233}U/^{235}U$ ratio of the BSU1B tracer.

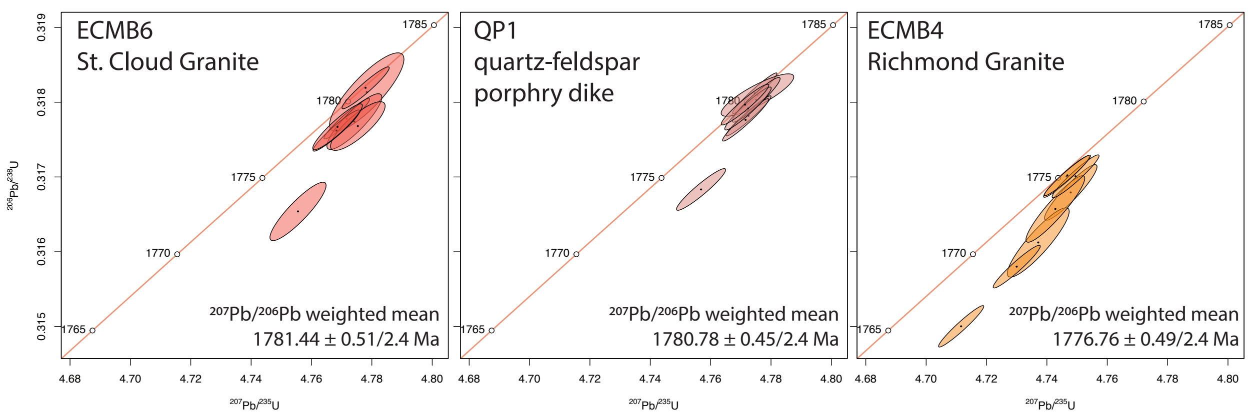

Figure SI2. U-Pb concordia plots for the new zircon dates. Ellipses represent 2σ analytical uncertainty on individual zircon dates. The weighted mean dates are shown with X/Y uncertainty where X is 2σ analytical uncertainty and Z is 2σ uncertainty including decay constant uncertainty.

ID-TIMS U-Pb dates and uncertainties were calculated using the algorithms of Schmitz and Schoene (2007), BSU1B tracer solution with calibration of $^{235}U/^{205}Pb = 77.93$ and $^{233}U/^{235} = 1.007066$, and U decay constants recommended by Hiess et al. (2012), including $^{238U}/^{235}U$ of

137.818. $^{206}Pb/^{238}U$ ratios and dates were corrected for initial ^{230}Th disequilibrium using DTh/U = 0.20 ± 0.05 (1σ). All common Pb in analyses was attributed to laboratory blank and subtracted based on the measured laboratory Pb isotopic composition and associated uncertainty. U blanks are estimated at 0.013 pg. ID-TIMS weighted mean $^{207}Pb/^{206}Pb$ dates were calculated from equivalent dates (pof >0.05) using Isoplot 3.0 (Ludwig, 2003). Errors on the weighted mean dates are given as ± x / z, where x is the internal error based on analytical uncertainties including counting statistics, subtraction of tracer solution, and blank and initial common Pb subtraction; z also includes the U decay constant uncertainties propagated in quadrature. Dates from individual zircon fractions and weighted mean dates are reported at 2σ.

LA-ICP-MS U-Pb apatite geochronology methods

Apatite U-Pb geochronology data were developed via laser ablation inductively coupled mass spectrometry (LA-ICP-MS) at UC Santa Barbara. U-Pb isotopes were analyzed with a Cetac Teledyne 193 nm excimer Analyte laser with a HelEx ablation cell coupled to a Nu Instruments Plasma 3D multi-collector (MC) ICP-MS. On the Plasma 3D, ^{204}(Pb+Hg), ^{206}Pb, ^{207}Pb, and ^{208}Pb were measured on Daly detectors and ^{238}U and ^{232}Th were measured on Faraday collectors. Apatite was ablated with a 40 μm diameter laser spot for 60 pulses fired at a 4 Hz repetition rate and 50% of 5 mJ laser power. Each ablation sequence consisted of 2 cleaning shots, followed by 25 secs of monitored washout and 15 secs of ablation. The Iolite v. 2.5 program (Paton et al., 2011) in the Igor Pro software environment was used to correct the raw U-Pb ratios for baselines, laser- and plasma-induced element fractionation, and instrument drift.

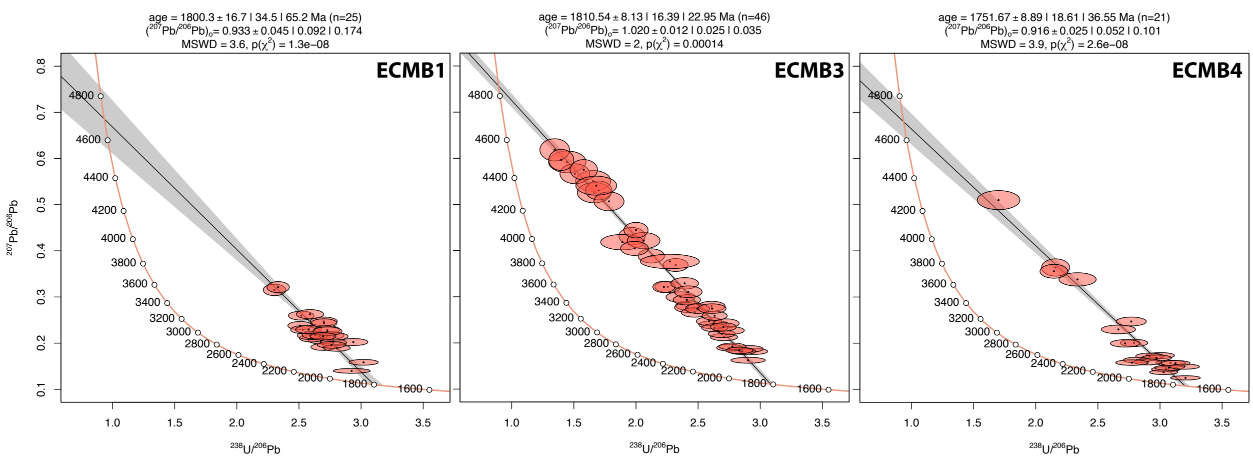

Figure SI3. U-Pb Tera-Wasserburg plots for the new apatite dates. Ellipses represent 2σ analytical uncertainty on individual apatite dates. The

Multiple apatite reference materials (RMs) were analyzed throughout the analytical session to monitor data quality. Apatite RM Madagascar (478.4 ± 6.1 Ma, ID-TIMS age; Schmitz, 2020 personal communication) served as the primary bracketing standard with RMs McClure (523.5 ± 1.5 Ma, ID-TIMS age; Schoene and Bowring, 2006), 401 (530.3 ± 1.5 Ma, ID-ICP-MS age; Thompson et al., 2016) and OD306 (1596.7 ± 7.1 Ma, ID-ICP-MS age; Thompson et al., 2016) analyzed as secondary standards to assess precision and accuracy. All of the secondary standards form mixing arrays between common-Pb and an age intercept. The excess variances of

$^{206}Pb/^{238}U$ and $^{207}Pb/^{206}Pb$ required for secondary standards to conform to a statistically single mixing line are 2.1% and 2.0% (2σ), respectively; these values were added in quadrature to the internal uncertainties of each U-Pb datum (Horstwood et al., 2016). The ages of the secondary standards with these designated uncertainties are 547.4 ± 30.4/35.9 Ma (McClure), 512.8 ± 9.8/10.5 Ma (401), 1586.5 ± 14.9/15.7 Ma (OD306) (uncertainties following the same format used in main text), within uncertainty of their published ages. Although mass-204 was measured on the MC-ICP-MS, isobaric interferences with ^{204}Hg in the He carrier gas preclude the use of the ^{204}Pb method for common-Pb corrections. The U-Pb apatite data are reported in Table S2.

Table S1: Zircon U-Th-Pb isotopic data

	Compositional Parameters						Radiogenic Isotope Ratios								Isotopic Ages (Ma)						Weighted Mean (Ma)
Sample (a)	Th/U (b)	^{206}Pb* x10^{-13} mol (c)	mol % ^{206}Pb* (c)	Pb*/Pb$_c$ (c)	Pb$_c$ (pg) (c)	^{206}Pb/^{204}Pb (d)	^{208}Pb/^{206}Pb (e)	^{207}Pb/^{206}Pb (e)	% err (f)	^{207}Pb/^{235}U (e)	% err (f)	^{206}Pb/^{238}U (e)	% err (f)	corr. coef.	^{207}Pb/^{206}Pb (g)	± (f)	^{207}Pb/^{235}U (g)	± (f)	^{206}Pb/^{238}U (g)	± (f)	^{207}Pb/^{206}Pb (h)
ECMB4																					
z1	0.459	1.7560	99.84%	189	0.24	11080	0.134	0.108748	0.071	4.747907	0.150	0.316793	0.096	0.927	1777.72	1.29	1775.74	1.26	1774.05	1.50	
z2	0.538	2.9136	99.88%	258	0.29	14816	0.157	0.108642	0.065	4.746500	0.131	0.317007	0.072	0.961	1775.96	1.19	1775.49	1.10	1775.09	1.12	
z3	0.482	0.8672	99.78%	138	0.16	8032	0.141	0.108731	0.088	4.737140	0.177	0.316124	0.120	0.896	1777.44	1.60	1773.83	1.49	1770.77	1.85	
z4	0.468	1.1223	99.79%	144	0.20	8395	0.137	0.108707	0.076	4.742804	0.168	0.316572	0.115	0.921	1777.04	1.39	1774.84	1.41	1772.97	1.78	**1776.76 ± 0.49 [2.40]** MSWD = 1.15 POF = 0.33
z5	0.572	2.6740	99.84%	201	0.35	11478	0.167	0.108678	0.068	4.730009	0.135	0.315801	0.074	0.952	1776.56	1.25	1772.57	1.13	1769.19	1.14	
z6	0.467	3.2913	99.82%	173	0.49	10119	0.136	0.108710	0.067	4.749514	0.134	0.317009	0.074	0.956	1777.10	1.22	1776.02	1.12	1775.11	1.15	
z7	0.446	3.8518	99.92%	381	0.26	22347	0.130	0.108530	0.064	4.711602	0.130	0.315002	0.072	0.959	1774.07	1.17	1769.30	1.09	1765.27	1.11	
z8	0.506	5.8883	99.75%	119	1.28	6606	0.148	0.108644	0.067	4.746793	0.132	0.317021	0.070	0.959	1775.98	1.23	1775.54	1.10	1775.17	1.09	
QP1																					
z1	0.359	9.6958	99.96%	768	0.32	45979	0.105	0.108903	0.061	4.774622	0.126	0.318120	0.070	0.967	1780.33	1.12	1780.45	1.06	1780.54	1.08	
z2	0.401	4.9637	98.54%	21	6.10	1236	0.117	0.108932	0.149	4.775515	0.206	0.318096	0.073	0.847	1780.81	2.72	1780.60	1.73	1780.43	1.14	
z3	0.423	6.4130	99.89%	269	0.61	15865	0.123	0.108960	0.064	4.772557	0.128	0.317818	0.069	0.967	1781.28	1.16	1780.08	1.07	1779.06	1.07	
z4	0.336	2.7906	99.91%	325	0.21	19550	0.098	0.108956	0.064	4.771584	0.131	0.317764	0.073	0.963	1781.22	1.17	1779.91	1.10	1778.80	1.13	**1780.78 ± 0.45 [2.39]** MSWD = 0.53 POF = 0.82
z5	0.366	2.5302	99.85%	198	0.32	11825	0.107	0.108944	0.068	4.775083	0.136	0.318032	0.077	0.944	1781.02	1.24	1780.53	1.14	1780.11	1.19	
z6	0.360	2.8906	99.92%	401	0.18	23996	0.105	0.108922	0.066	4.772373	0.132	0.317916	0.074	0.951	1780.65	1.20	1780.05	1.11	1779.54	1.15	
z7	0.451	5.0856	99.69%	100	1.30	5857	0.131	0.108882	0.072	4.771395	0.135	0.317968	0.070	0.952	1779.98	1.31	1779.88	1.13	1779.80	1.08	
z8	0.455	2.5040	99.63%	84	0.76	4943	0.133	0.108938	0.076	4.756832	0.140	0.316833	0.072	0.942	1780.92	1.39	1777.31	1.18	1774.25	1.12	
ECMB6																					
z1	0.284	1.213	0.990	30.870	0.97	1899.098	0.083	0.108982	0.123	4.778311	0.211	0.318136	0.135	0.834	1781.66	2.25	1781.10	1.77	1780.62	2.11	
z2	0.335	4.276	0.999	226.896	0.47	13671.762	0.098	0.108953	0.066	4.771689	0.130	0.317780	0.070	0.958	1781.17	1.20	1779.93	1.09	1778.88	1.10	
z3	0.376	2.430	0.998	155.473	0.39	9279.850	0.110	0.109024	0.086	4.774201	0.156	0.317741	0.096	0.872	1782.35	1.57	1780.37	1.31	1778.69	1.48	
z4	0.476	1.918	0.998	191.621	0.26	11163.360	0.139	0.109071	0.098	4.775361	0.155	0.317681	0.084	0.822	1783.14	1.80	1780.58	1.30	1778.39	1.30	**1781.44 ± 0.51 [2.40]** MSWD = 1.24 POF = 0.28
z5	0.315	2.478	0.999	228.261	0.27	13819.538	0.092	0.108954	0.069	4.777931	0.134	0.318193	0.072	0.953	1781.18	1.25	1781.03	1.13	1780.90	1.13	
z6	0.332	1.064	0.998	155.064	0.17	9355.845	0.097	0.109010	0.084	4.755533	0.160	0.316539	0.101	0.893	1782.11	1.52	1777.08	1.35	1772.81	1.57	
z7	0.342	2.990	0.999	215.887	0.35	12986.019	0.100	0.108930	0.069	4.768270	0.133	0.317621	0.071	0.946	1780.77	1.26	1779.33	1.11	1778.10	1.11	
z8	0.368	2.149	0.998	126.819	0.43	7588.570	0.107	0.108921	0.074	4.768637	0.141	0.317671	0.079	0.931	1780.62	1.35	1779.39	1.18	1778.35	1.22	

(a) z1, z2 etc. are labels for single zircon grains or fragments annealed and chemically abraded after Mattinson (2005). Bold indicates z fraction included in weighted mean.
(b) Model Th/U ratio iteratively calculated from the radiogenic ^{208}Pb/^{206}Pb ratio and ^{206}Pb/^{238}U age.
(c) Pb* and Pbc represent radiogenic and common Pb, respectively; mol % ^{206}Pb* with respect to radiogenic, blank and initial common Pb.
(d) Measured ratio corrected for spike and fractionation only. Fractionation estimated at 0.16 ± 0.03 %/a.m.u. (1 sigma) for Daly analyses, based on analyses of EARTHTIME 202-205 trace solution run recently.
(e) Corrected for fractionation, spike, and common Pb; all common Pb was assumed to be procedural blank: ^{206}Pb/^{204}Pb = 18.042 ± 0.61%; ^{207}Pb/^{204}Pb = 15.537 ± 0.52%; ^{208}Pb/^{204}Pb = 37.686 ± 0.63% (all uncertainties 1-sigma).
(f) Errors are 2 sigma, propagated using the algorithms of Schmitz and Schoene (2007).
(g) Calculations are based on the decay constants of Jaffey et al. (1971) and Hiess et al. (2012). ^{206}Pb/^{238}U and ^{207}Pb/^{206}Pb ages corrected for initial disequilibrium in ^{230}Th/^{238}U using DTh/U [magma] = 0.20 ± 0.05 (1 sigma).
(h) Weighted mean ± 2s internal uncertainty [± 2s internal + decay constaint uncertainties]. MSWD = Mean Standard Weighted Deviation. POF = Probability of Fit

Table S2: Apatite U-Pb data

Spot name	U (ppm)	Th (ppm)	207Pb/235U	2 SE (%)	206Pb/238U	2 SE (%)	rho	238U/206Pb	2 SE (%)	207Pb/206Pb	2 SE (%)
ECMB1											
ECMB1_1	49.6	28.3	10.6010	4.4	0.3734	3.1	0.71	2.6781	3.1	0.2060	3.1
ECMB1_2	54.4	24.3	9.7938	4.4	0.3707	3.1	0.70	2.6976	3.1	0.1917	3.1
ECMB1_3	33.1	28.4	12.6190	4.5	0.3704	3.3	0.73	2.6998	3.3	0.2472	3.1
ECMB1_4	44.1	12.5	10.8580	4.6	0.3634	3.3	0.71	2.7518	3.3	0.2168	3.2
ECMB1_5	53.9	12.7	9.4952	4.5	0.3404	3.3	0.73	2.9377	3.3	0.2024	3.1
ECMB1_7	36.7	21.4	12.4303	4.4	0.3701	3.1	0.72	2.7020	3.1	0.2437	3.0
ECMB1_8	35.0	11.3	13.0744	4.4	0.3986	3.2	0.72	2.5088	3.2	0.2380	3.1
ECMB1_9	18.9	4.0	18.8677	4.6	0.4342	3.2	0.71	2.3031	3.2	0.3153	3.2
ECMB1_10	43.1	17.7	11.1589	4.5	0.3841	3.1	0.70	2.6035	3.1	0.2108	3.2
ECMB1_11	35.2	92.0	11.5084	4.7	0.3857	3.3	0.71	2.5927	3.3	0.2165	3.3
ECMB1_12	34.6	15.8	12.4772	4.4	0.3950	3.2	0.72	2.5316	3.2	0.2292	3.1
ECMB1_13	48.9	16.5	9.9917	4.4	0.3601	3.1	0.72	2.7770	3.1	0.2013	3.0
ECMB1_14	56.7	21.5	9.3120	4.4	0.3565	3.1	0.72	2.8050	3.1	0.1895	3.0
ECMB1_15	35.4	15.2	11.3952	4.5	0.3801	3.3	0.73	2.6309	3.3	0.2175	3.0
ECMB1_16	56.8	23.2	9.7936	4.5	0.3621	3.4	0.74	2.7617	3.4	0.1963	3.0
ECMB1_17	97.9	67.0	7.2326	4.5	0.3311	3.2	0.71	3.0202	3.2	0.1585	3.2
ECMB1_19	28.9	6.7	14.2073	4.5	0.3971	3.4	0.74	2.5183	3.4	0.2596	3.0
ECMB1_20	41.0	13.5	10.6404	4.6	0.3596	3.4	0.73	2.7809	3.4	0.2147	3.1
ECMB1_21	27.3	4.0	13.9859	4.7	0.3863	3.5	0.74	2.5887	3.5	0.2627	3.1
ECMB1_22	41.1	19.6	12.2605	4.6	0.3878	3.4	0.74	2.5786	3.4	0.2294	3.1
ECMB1_23	18.8	18.3	18.9832	4.4	0.4287	3.2	0.72	2.3326	3.2	0.3213	3.1
ECMB1_24	39.2	13.3	11.5599	4.4	0.3666	3.1	0.69	2.7278	3.1	0.2288	3.2
ECMB1_25	38.3	14.2	11.4021	4.9	0.3664	3.5	0.72	2.7293	3.5	0.2258	3.4
ECMB1_26	164.9	3840.0	6.5949	5.2	0.3419	4.2	0.81	2.9248	4.2	0.1400	3.0
ECMB1_27	38.6	11.9	10.9887	4.4	0.3712	3.1	0.72	2.6940	3.1	0.2148	3.1
~~ECMB1_6~~	~~18.4~~	~~3.7~~	~~18.7929~~	~~4.6~~	~~0.5173~~	~~3.4~~	~~0.73~~	~~1.9331~~	~~3.4~~	~~0.2636~~	~~3.1~~
~~ECMB1_18~~	~~30.5~~	~~6.4~~	~~15.0260~~	~~4.8~~	~~0.4509~~	~~3.6~~	~~0.76~~	~~2.2178~~	~~3.6~~	~~0.2418~~	~~3.2~~
~~ECMB1_28~~	~~38.1~~	~~24.4~~	~~14.3511~~	~~4.8~~	~~0.4319~~	~~3.7~~	~~0.77~~	~~2.3154~~	~~3.7~~	~~0.2411~~	~~3.1~~
~~ECMB1_29~~	~~48.7~~	~~29.8~~	~~11.2605~~	~~4.5~~	~~0.4015~~	~~3.2~~	~~0.72~~	~~2.4907~~	~~3.2~~	~~0.2035~~	~~3.1~~
~~ECMB1_30~~	~~34.2~~	~~10.6~~	~~15.0964~~	~~4.8~~	~~0.4970~~	~~3.8~~	~~0.78~~	~~2.0121~~	~~3.8~~	~~0.2204~~	~~3.1~~
ECMB3											
ECMB3_1	70.1	179.1	8.5024	4.4	0.3394	3.2	0.72	2.9464	3.2	0.1818	3.0
ECMB3_2	33.3	121.6	12.5593	4.9	0.3805	3.8	0.78	2.6281	3.8	0.2395	3.1
ECMB3_3	28.5	72.2	13.1515	4.4	0.3865	3.2	0.72	2.5873	3.2	0.2469	3.1
ECMB3_4	22.0	64.8	15.9828	4.6	0.4130	3.4	0.74	2.4213	3.4	0.2808	3.1
ECMB3_5	22.3	60.6	14.7595	4.7	0.3833	3.4	0.73	2.6089	3.4	0.2794	3.2
ECMB3_6	22.5	72.0	15.7819	4.7	0.4140	3.5	0.75	2.4155	3.5	0.2766	3.1
ECMB3_7	15.9	42.4	19.6392	4.9	0.4431	3.8	0.77	2.2568	3.8	0.3216	3.1
ECMB3_8	4.8	6.3	45.8747	7.7	0.6040	7.0	0.90	1.6556	7.0	0.5511	3.3
ECMB3_9	3.8	6.7	56.4061	9.1	0.6910	8.5	0.93	1.4472	8.5	0.5923	3.2
ECMB3_10	59.0	158.7	8.8574	4.5	0.3435	3.2	0.71	2.9112	3.2	0.1871	3.1
ECMB3_11	48.1	147.1	10.8222	4.5	0.3692	3.3	0.73	2.7086	3.3	0.2127	3.0
ECMB3_12	21.0	53.0	14.8251	4.8	0.4044	3.6	0.75	2.4728	3.6	0.2660	3.1
ECMB3_13	15.9	49.1	19.8998	4.5	0.4494	3.3	0.73	2.2252	3.3	0.3213	3.1
ECMB3_14	15.4	33.1	18.9633	4.9	0.4181	3.8	0.78	2.3918	3.8	0.3291	3.1
ECMB3_15	17.0	50.8	17.4913	5.1	0.4239	4.1	0.79	2.3590	4.1	0.2994	3.1
ECMB3_16	42.6	65.7	8.7769	4.4	0.3503	3.1	0.70	2.8547	3.1	0.1818	3.1
ECMB3_17	42.6	118.3	11.2602	4.5	0.3717	3.3	0.74	2.6903	3.3	0.2198	3.0
ECMB3_18	4.9	11.6	43.5264	7.5	0.6010	6.7	0.89	1.6639	6.7	0.5255	3.4
ECMB3_19	8.0	13.0	30.2100	5.7	0.5080	4.4	0.78	1.9685	4.4	0.4315	3.5
ECMB3_20	47.8	96.7	9.4929	4.4	0.3631	3.1	0.70	2.7541	3.1	0.1897	3.2
ECMB3_21	12.5	32.3	21.9116	4.7	0.4311	3.5	0.75	2.3196	3.5	0.3688	3.1
ECMB3_22	4.2	7.6	51.7630	7.2	0.6630	6.5	0.90	1.5083	6.5	0.5665	3.1
ECMB3_23	5.2	7.7	42.9820	6.0	0.5880	5.1	0.85	1.7007	5.1	0.5304	3.2
ECMB3_24	3.4	5.5	63.3132	7.9	0.7430	7.3	0.92	1.3459	7.3	0.6183	3.2
ECMB3_26	20.3	51.3	16.7809	4.9	0.4150	3.7	0.77	2.4096	3.7	0.2934	3.1
ECMB3_27	8.1	18.1	30.5038	8.2	0.5290	7.6	0.92	1.8904	7.6	0.4184	3.3
ECMB3_28	6.0	10.9	39.1760	6.5	0.5610	5.6	0.86	1.7825	5.6	0.5067	3.3
ECMB3_29	60.4	174.2	9.5511	4.5	0.3602	3.2	0.72	2.7762	3.2	0.1924	3.1
ECMB3_30	28.5	54.8	12.2504	4.5	0.3667	3.1	0.69	2.7270	3.1	0.2424	3.3
ECMB3_31	112.7	387.0	7.7152	5.0	0.3445	3.9	0.77	2.9028	3.9	0.1625	3.2
ECMB3_32	10.4	28.3	25.2184	5.2	0.4710	4.1	0.78	2.1231	4.1	0.3885	3.2
ECMB3_33	8.6	20.1	28.1872	6.2	0.4850	5.2	0.84	2.0619	5.2	0.4217	3.4
ECMB3_34	10.0	31.6	22.8309	9.2	0.4400	8.5	0.93	2.2727	8.5	0.3765	3.4
ECMB3_35	22.9	62.7	15.1554	4.4	0.4009	3.2	0.71	2.4944	3.2	0.2743	3.1
ECMB3_36	40.7	128.6	11.3333	4.5	0.3622	3.3	0.74	2.7609	3.3	0.2270	3.0
ECMB3_38	45.8	70.3	8.9418	4.4	0.3530	3.1	0.71	2.8329	3.1	0.1838	3.1
ECMB3_39	25.8	85.4	13.5569	4.4	0.3798	3.2	0.72	2.6330	3.2	0.2590	3.1
ECMB3_40	36.3	128.5	12.1928	4.5	0.3797	3.3	0.73	2.6337	3.3	0.2330	3.0
ECMB3_42	4.2	6.3	58.7790	6.7	0.7150	5.9	0.88	1.3986	5.9	0.5965	3.1
ECMB3_43	33.8	90.3	11.9596	4.4	0.3699	3.1	0.71	2.7034	3.1	0.2346	3.1
ECMB3_44	23.1	72.5	14.4674	4.7	0.3827	3.5	0.75	2.6130	3.5	0.2743	3.1
ECMB3_45	8.6	11.8	28.0617	5.5	0.5030	4.6	0.83	1.9881	4.6	0.4048	3.1
ECMB3_46	4.3	6.7	50.1885	6.5	0.6330	5.7	0.88	1.5798	5.7	0.5753	3.1
ECMB3_47	7.6	9.7	30.6232	5.0	0.5000	4.0	0.79	2.0000	4.0	0.4444	3.1
ECMB3_48	16.9	32.0	17.7004	5.0	0.4131	3.8	0.75	2.4207	3.8	0.3109	3.3
ECMB3_49	5.2	9.3	44.3465	8.6	0.5950	8.0	0.93	1.6807	8.0	0.5408	3.1
~~ECMB3_25~~	~~9.4~~	~~17.7~~	~~29.5612~~	~~6.0~~	~~0.5490~~	~~5.0~~	~~0.83~~	~~1.8215~~	~~5.0~~	~~0.3907~~	~~3.4~~
~~ECMB3_37~~	~~18.1~~	~~33.5~~	~~19.5908~~	~~4.7~~	~~0.4972~~	~~3.6~~	~~0.76~~	~~2.0113~~	~~3.6~~	~~0.2859~~	~~3.1~~
~~ECMB3_41~~	~~42.7~~	~~97.2~~	~~11.2835~~	~~4.5~~	~~0.3959~~	~~3.3~~	~~0.73~~	~~2.5259~~	~~3.3~~	~~0.2068~~	~~3.1~~

ECMB4											
ECMB4_1	42.2	132.0	7.9502	4.4	0.3331	3.1	0.71	3.0021	3.1	0.1732	3.1
ECMB4_2	20.5	32.1	9.9057	4.6	0.3583	3.2	0.71	2.7910	3.2	0.2006	3.2
ECMB4_3	86.8	161.3	6.4967	4.3	0.3282	3.1	0.71	3.0469	3.1	0.1436	3.0
ECMB4_4	23.4	75.2	10.1149	4.8	0.3677	3.6	0.74	2.7196	3.6	0.1996	3.3
ECMB4_5	6.8	16.9	23.2267	6.0	0.4630	4.3	0.71	2.1598	4.3	0.3640	4.2
ECMB4_6	54.4	168.0	7.0172	4.5	0.3241	3.2	0.71	3.0855	3.2	0.1571	3.1
ECMB4_7	42.2	92.3	8.1260	4.4	0.3428	3.2	0.71	2.9172	3.2	0.1720	3.1
ECMB4_8	43.1	47.8	7.8004	4.5	0.3365	3.3	0.73	2.9718	3.3	0.1682	3.1
ECMB4_9	77.4	218.3	6.9050	4.3	0.3200	3.1	0.71	3.1250	3.1	0.1566	3.1
ECMB4_10	243.4	362.4	5.3710	4.3	0.3120	3.1	0.71	3.2051	3.1	0.1249	3.0
ECMB4_11	128.9	247.7	6.2358	4.3	0.3301	3.1	0.71	3.0294	3.1	0.1371	3.1
ECMB4_12	7.9	25.3	19.9491	6.3	0.4280	5.2	0.83	2.3364	5.2	0.3382	3.5
ECMB4_13	2.6	4.4	41.3289	8.9	0.5880	8.3	0.93	1.7007	8.3	0.5100	3.3
ECMB4_14	7.8	16.4	22.8506	5.5	0.4660	4.3	0.78	2.1459	4.3	0.3558	3.4
ECMB4_15	42.9	96.1	7.9985	4.5	0.3554	3.2	0.72	2.8137	3.2	0.1633	3.1
ECMB4_16	71.2	137.0	6.5874	4.3	0.3256	3.1	0.71	3.0713	3.1	0.1468	3.0
ECMB4_17	67.9	117.3	6.4340	4.3	0.3129	3.1	0.72	3.1959	3.1	0.1492	3.0
ECMB4_18	43.6	44.7	7.5746	4.6	0.3448	3.2	0.69	2.9002	3.2	0.1594	3.3
ECMB4_19	49.5	147.3	7.8430	4.9	0.3605	3.8	0.78	2.7739	3.8	0.1579	3.1
ECMB4_20	12.3	20.5	11.8828	5.4	0.3752	4.2	0.78	2.6652	4.2	0.2298	3.3
ECMB4_21	15.2	37.2	12.2956	4.8	0.3612	3.6	0.75	2.7685	3.6	0.2470	3.2
Standards											
MAD_1	28.4	713.3	1.5713	3.3	0.0860	2.3	0.69	11.6306	2.3	0.1326	2.4
MAD_2	28.0	709.2	1.5796	3.2	0.0855	2.2	0.68	11.7000	2.2	0.1341	2.4
MAD_3	27.8	700.3	1.5342	3.4	0.0846	2.2	0.65	11.8217	2.2	0.1316	2.6
MAD_4	27.8	690.6	1.5090	3.3	0.0831	2.2	0.66	12.0279	2.2	0.1317	2.5
MAD_5	27.9	696.4	1.5248	3.3	0.0863	2.4	0.71	11.5875	2.4	0.1282	2.4
MAD_6	28.1	693.6	1.5438	3.3	0.0855	2.3	0.70	11.6945	2.3	0.1310	2.3
MAD_7	27.1	673.7	1.4123	3.2	0.0839	2.2	0.67	11.9246	2.2	0.1222	2.4
MAD_8	27.6	692.1	1.5598	3.3	0.0860	2.3	0.67	11.6279	2.3	0.1316	2.5
MAD_9	28.2	704.0	1.5330	3.5	0.0846	2.3	0.66	11.8217	2.3	0.1315	2.6
MAD_10	28.1	697.2	1.5045	3.3	0.0847	2.1	0.65	11.8078	2.1	0.1289	2.5
MAD_11	28.0	691.9	1.5490	3.3	0.0852	2.2	0.65	11.7440	2.2	0.1320	2.5
MAD_12	28.0	702.9	1.5404	3.2	0.0836	2.2	0.70	11.9617	2.2	0.1337	2.3
MAD_13	28.3	712.3	1.4711	3.4	0.0834	2.2	0.66	11.9919	2.2	0.1280	2.5
MAD_14	28.0	701.2	1.5407	3.4	0.0843	2.3	0.67	11.8610	2.3	0.1326	2.6
MAD_15	28.1	704.5	1.5307	3.4	0.0847	2.2	0.66	11.8036	2.2	0.1311	2.5
MAD_16	28.1	700.1	1.5184	3.5	0.0851	2.1	0.61	11.7454	2.1	0.1294	2.8
MAD_17	27.2	680.8	1.4555	3.3	0.0847	2.2	0.66	11.8078	2.2	0.1247	2.5
MAD_18	28.7	725.3	1.6133	3.2	0.0858	2.2	0.68	11.6605	2.2	0.1365	2.3
McClure_1	31.5	65.0	2.5769	3.4	0.1009	2.2	0.64	9.9157	2.2	0.1854	2.6
McClure_2	16.5	34.0	3.5750	3.5	0.1089	2.4	0.69	9.1827	2.4	0.2382	2.5
McClure_3	15.2	33.9	3.7798	3.7	0.1101	2.6	0.71	9.0827	2.6	0.2491	2.6
McClure_4	13.6	29.4	3.8994	3.5	0.1125	2.6	0.72	8.8889	2.6	0.2515	2.4
McClure_5	14.6	31.3	3.7320	3.4	0.1099	2.4	0.71	9.0992	2.4	0.2464	2.4
McClure_6	15.0	31.0	3.7084	4.2	0.1085	2.4	0.57	9.2166	2.4	0.2480	3.4
McClure_7	14.5	30.3	3.5285	3.7	0.1078	2.7	0.72	9.2764	2.7	0.2375	2.5
McClure_8	14.7	32.0	4.0311	3.6	0.1105	2.5	0.68	9.0498	2.5	0.2647	2.7
McClure_9	15.3	31.7	3.3715	3.8	0.1099	2.5	0.65	9.0992	2.5	0.2226	2.9
OD306_1	24.3	69.8	5.1614	6.1	0.2861	2.4	0.39	3.4953	2.4	0.1309	5.6
OD306_2	24.8	67.1	4.5124	3.4	0.2825	2.3	0.66	3.5398	2.3	0.1159	2.6
OD306_3	14.0	56.0	4.9799	6.3	0.2893	2.6	0.42	3.4566	2.6	0.1249	5.7
OD306_4	22.9	67.7	4.9913	4.1	0.2845	2.4	0.59	3.5149	2.4	0.1273	3.3
OD306_5	23.8	68.6	4.1846	3.1	0.2813	2.1	0.70	3.5549	2.1	0.1079	2.2
OD306_6	18.3	36.9	4.4793	3.3	0.2889	2.3	0.71	3.4614	2.3	0.1125	2.3
OD306_7	20.3	48.6	4.3296	3.3	0.2843	2.3	0.69	3.5174	2.3	0.1105	2.4
OD306_8	19.8	40.4	4.4902	3.4	0.2909	2.3	0.68	3.4376	2.3	0.1120	2.5
OD306_9	23.9	62.4	5.2166	3.8	0.2861	2.2	0.58	3.4953	2.2	0.1323	3.1
OD306_10	19.7	39.8	4.2460	3.7	0.2811	2.4	0.64	3.5575	2.4	0.1096	2.8
OD306_11	22.9	45.4	4.3426	3.2	0.2849	2.2	0.69	3.5100	2.2	0.1106	2.3
OD306_12	24.0	73.8	4.6749	4.0	0.2815	2.2	0.57	3.5524	2.2	0.1205	3.3
OD306_13	11.3	25.1	4.2567	3.4	0.2831	2.5	0.72	3.5323	2.5	0.1091	2.4
OD306_14	24.0	65.6	4.8882	3.6	0.2784	2.4	0.67	3.5920	2.4	0.1274	2.7
OD306_15	26.1	80.7	4.4955	3.1	0.2812	2.1	0.69	3.5562	2.1	0.1160	2.3
OD306_16	19.0	38.6	5.6322	5.0	0.2880	2.4	0.48	3.4722	2.4	0.1419	4.4
OD306_17	9.5	20.9	9.2240	6.4	0.3210	4.0	0.62	3.1153	4.0	0.2085	5.1
OD306_18	24.1	67.8	5.1256	3.5	0.2901	2.2	0.62	3.4471	2.2	0.1282	2.7
401_1	19.3	139.5	1.0279	4.2	0.0890	2.5	0.59	11.2360	2.5	0.0838	3.4
401_2	19.0	144.6	1.2461	4.4	0.0917	2.4	0.55	10.9051	2.4	0.0986	3.6
401_3	19.1	140.0	0.9271	4.1	0.0884	2.4	0.58	11.3122	2.4	0.0761	3.3
401_4	18.3	137.1	0.9784	4.8	0.0883	2.4	0.49	11.3250	2.4	0.0804	4.2
401_5	19.0	132.4	0.8781	3.6	0.0861	2.3	0.62	11.6144	2.3	0.0740	2.8
401_6	19.7	138.0	0.8524	3.8	0.0859	2.6	0.68	11.6414	2.6	0.0720	2.8
401_7	19.6	137.3	0.8867	4.5	0.0871	2.2	0.49	11.4863	2.2	0.0739	3.9
401_8	19.2	140.3	1.0044	4.6	0.0892	2.8	0.60	11.2108	2.8	0.0817	3.7
401_9	19.1	139.2	0.8821	3.6	0.0872	2.2	0.61	11.4679	2.2	0.0734	2.9
401_10	19.8	143.1	0.8847	3.8	0.0855	2.2	0.58	11.6986	2.2	0.0751	3.1
401_11	19.6	141.1	0.8927	3.6	0.0873	2.4	0.67	11.4548	2.4	0.0742	2.7
401_12	20.1	149.2	0.8859	3.7	0.0852	2.2	0.59	11.7302	2.2	0.0754	3.0
401_13	19.1	139.5	0.9152	4.3	0.0877	2.2	0.52	11.3999	2.2	0.0757	3.6
401_14	19.4	140.3	0.8451	4.1	0.0853	2.3	0.55	11.7247	2.3	0.0719	3.4
401_15	19.6	140.1	0.8696	3.8	0.0855	2.3	0.60	11.6959	2.3	0.0738	3.1
401_16	19.6	140.9	0.9218	4.3	0.0851	2.5	0.58	11.7509	2.5	0.0786	3.5

Strikethrough indicates data discarded because final integrations were not flat

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