

Table S1. Showing the correlation coefficient matrix of the observed magnetic parameters.

	χ_{lf}	$\chi_{fd}\%$	χ_{ARM}	SIRM	S-Ratio	Soft-IRM	ARM/SIRM	SIRM/ χ_L	χ_{ARM}/χ_{LF}
χ_{lf}	1	-0.10	1.00	1.00	0.20	0.99	-0.35	0.85	0.45
$\chi_{fd}\%$		1	-0.10	-0.10	0.00	-0.09	0.13	-0.17	-0.06
χ_{ARM}			1	0.99	0.20	0.98	-0.30	0.84	0.50
SIRM				1	0.19	0.99	-0.36	0.86	0.44
S-Ratio					1	0.16	-0.23	0.06	-0.14
Soft-IRM						1	-0.36	0.86	0.44
ARM/SIRM							1	-0.45	0.53
SIRM/ χ_L								1	0.52
χ_{ARM}/χ_{LF}									1

Table S2. Variations of environmental magnetic parameters along the ANL supplementary archive.

Samp le	Dept h (cm)	Weig ht (g)	clf (10- 8m3kg -1)	cf d %	cARM (10- 8m3kg- 1)	SIRM (10 ⁻⁵ Am ² kg ⁻¹)	S- Rati o	Soft (10 ⁻⁵ Am ² kg ⁻¹)	ARM/SIR M (10 ⁻³)	SIRM/c LF (10 ³ A/m)	cARM/c LF
1	2.5	11.25 11.88	88.90	2.74	159.66	1299.17	1.00	1086.0 4	9.78	14.61	1.80
2	7.5	9 11.95	67.10	1.82	117.27	936.95	0.97	808.78 1095.4	9.96	13.96	1.75
3	12.5	8 11.55	88.40	1.49	151.12	1263.70	1.00	3 1468.8	9.52	14.30	1.71
4	17.5	5 11.67	114.55	0.08	203.62	1752.82	0.99	9 1351.1	9.25	15.30	1.78
5	22.5	6 11.84	106.00	2.09	195.33	1537.80	1.00	5 1028.5	10.11	14.51	1.84
6	27.5	4 12.14	88.91	1.74	153.87	1216.84	1.00	3	10.07	13.69	1.73
7	32.5	8 12.02	64.02	3.05	108.85	762.97	0.95	747.06	11.36	11.92	1.70
8	37.5	5 11.45	71.27	1.74	116.72	972.97	1.00	828.57 1125.4	9.55	13.65	1.64
9	42.5	2 11.92	90.41	2.58	160.35	1218.13	1.00	4	10.48	13.47	1.77
10	47.5	3 11.70	61.25	2.24	105.21	839.91	0.96	724.46	9.97	13.71	1.72
11	55	9 11.94	60.21	1.98	102.32	832.69	0.96	695.50 2722.5	9.78	13.83	1.70
12	65	3 11.47	174.72	1.16	347.13	3274.93 11614.9	1.00	6 8720.7	8.44	18.74	1.99
13	75	9 12.23	522.26	1.65	1132.06	1	1.00	9 5781.0	7.76	22.24	2.17
14	85	8 11.44	346.95	2.62	702.97	7478.11 10422.1	0.98	5 10363.	7.48	21.55	2.03
15	95	9 11.49	473.26	2.16	935.41	5	0.97	22 4816.0	7.14	22.02	1.98
16	105	3 11.36	299.23	1.64	613.99	5985.99 12057.1	0.98	7 9031.0	8.16	20.00	2.05
17	115	1	556.11	1.36	1200.73	1	0.99	9 2092.1	7.93	21.68	2.16
18	125	11.35 11.34	146.08	1.68	304.66	2294.81	0.97	1 2965.9	10.57	15.71	2.09
19	135	7	196.38	2.11	418.06	3380.61	0.98	4	9.84	17.21	2.13

20	145	11.54	106.99	2.04	211.62	1500.79	0.96	1428.1			
		11.52				17796.1		3	11.22	14.03	1.98
21	155	6	781.57	1.47	1691.53	1	1.00	12612.88	7.57	22.77	2.16
		11.94				12081.2		8390.6			
22	165	5	512.54	1.59	1038.76	3	0.98	7	6.84	23.57	2.03
		11.78						3196.0			
23	175	6	209.77	1.60	417.34	4364.07	0.97	6	7.61	20.80	1.99
		12.16						1796.8			
24	185	8	124.42	1.82	233.20	1970.07	0.97	0	9.42	15.83	1.87
		11.62						3378.6			
25	195	6	218.02	1.78	426.00	4456.14	0.97	9	7.61	20.44	1.95
	202.	11.47						3103.5			
26	5	7	198.34	1.59	377.85	3902.00	0.97	5	7.71	19.67	1.91
	207.	11.83						4596.8			
27	5	2	283.36	1.35	564.13	5751.84	0.97	2	7.81	20.30	1.99
	212.	11.93						2529.3			
28	5	4	168.04	1.90	330.22	3153.38	0.97	6	8.34	18.77	1.97
	217.							2964.3			
29	5	11.58	189.06	1.58	375.32	3536.26	0.97	3	8.45	18.70	1.99
	222.	11.46						2967.5			
30	5	6	190.80	2.00	371.09	3536.68	0.97	3	8.35	18.54	1.94