27. PRELIMINARY PALEOMAGNETIC RESULTS, LEG 7[1]

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Paleomagnetic measurements were made on cores from Sites 66-0 and 66-1, located at 2° 23.6′N, 166° 07.3′W. Many of the sections of cores from both sites were highly disturbed. Wherever possible, care was taken to select the rectanuglar 7.5 cubic centimeter samples from segments which showed horizontal bedding. The data presented in the accompanying table (Table 1) were obtained with a PAL Spinner Magnetometer operating at 15 hertz. Four measurements were made of the X, Y and Z components of magnetization for each sample. The mean values were used to calculate the inclination, declination, and intensity of magnetization of each sampel. Estimates of the standard deviations of inclination, declination, and intensity were computed from the scatter among the X, Y and Z values. Inclinations are with respect to the present horizontals, + downward, assuming vertical drill holes. Declinations are relative only to a given core barrel, assuming no rotation within the barrel.

With the exception of Cores 2 and 3 at Site 66-0, all samples were run before and after demagnetization in a 50-oersted peak alternating field. The intensities of the samples from Cores 2 and 3 were so low after demagnetization that only a few samples were run using long time constants. Four samples of representative lithologies were demagnetized at 100 oersteds. Plots of sample intensity versus the intensity of the demagnetizing field are presented in Figures 1 through 4. Cores 2 and 3 of Site 66-0 and all cores from Site 66-1 consisted largely of Radiolaria. Samples from these cores had intensities near the noise level of the spinner and consequently show high scatter for repeated measurements. Samples from Cores 6, 7, 8 and 9 of Site 66-0 have much higher intensities and exhibit significantly less scatter. Only these values are considered reliable.

CONCLUSIONS

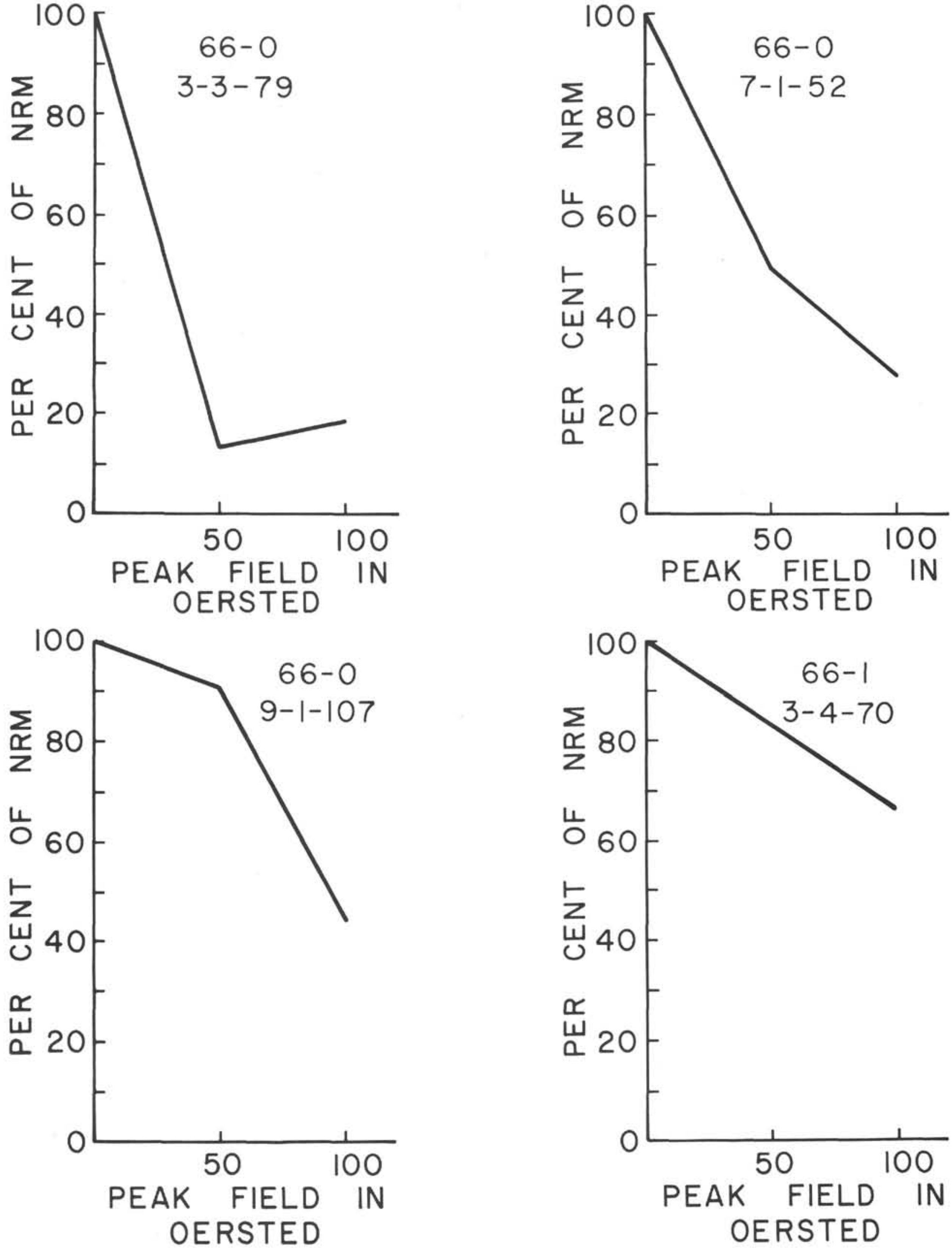
As shown by Figures 6 through 9, and as previously discussed by Henry and Opdyke (1970), declinations of DSDP samples vary considerably within cores, probably due to totation of the barrel during drilling. Attempts at paleomagnetic stratigraphy are therefore based solely on the sign of the inclination. It should be emphasized that, because of the scatter of inclination values, reversals based on only one or two samples may not be real. Figure 5 includes the preliminary magnetic stratigraphy of the oldest sediments of Site 66-0. Most of the samples show negative inclinations as being indicative (in the southern hemisphere) of normally polarized samples. Because the inclinations are high and any viscous magnetization due to the earth's present field would give low inclinations of the opposite sign, it is considered unlikely that the preponderance of normally magnetized samples can be accounted for by such viscous magnetization. The sample polarities may instead reflect a real preponderance of normal over reversed polarity during the Upper Cretaceous.

As detailed elsewhere in this volume, the oldest sediments at Site 66-0 are Cretaceous in age. It has been suggested that these sediments may have been deposited at more southerly latitudes because they are homotaxic with modern central water mass sediments, rather than with siliceous equatorial sediments. In addition to this evidence, the preliminary polar wandering curve for the central North Pacific of Francheteau *et al.* (1970), based on magnetization of seamounts, implies a predominantly northward movement of the central Pacific plate relative to the pole of about 30° since the Cretaceous. Sclater and Cox (1970) have shown that if compaction is assumed to have little effect on the direction of magnetization, the inclinations of Deep Sea Drilling samples can be used to calculate paleolatitudes. The means of the absolute values of the inclination for Cores 6, 7, and 8, and 9 of Site 66-0 are 39°, 50° and 53°, respectively (Figure 5). These values are consistent with a northward movement of 35° since the Cretaceous for this site. If viscous magnetization in the present field (Opdyke and Phillips, 1970) or flattening of the magnetic vectors due to compaction is significant, then the calculated paleolatitudes are too low, and the site may have come from even further south.

ACKNOWLEDGEMENTS

This work would not have been completed without the extensive help of Richard Whiteman who rebuilt our PAL Spinner to enable us to measure samples of low intensity. El L. Winterer supervised the sampling and R.

[1]Contribution of the Scripps Institution of Oceanography, new series



Figures 1-4. *Sample intensity versus intensity of demagnetizing field. Sample 66-0, 3-3-79; sample 66-0, 7-1-52; sample 66-0, 9-1-107; sample 66-1, 3-4-70.*

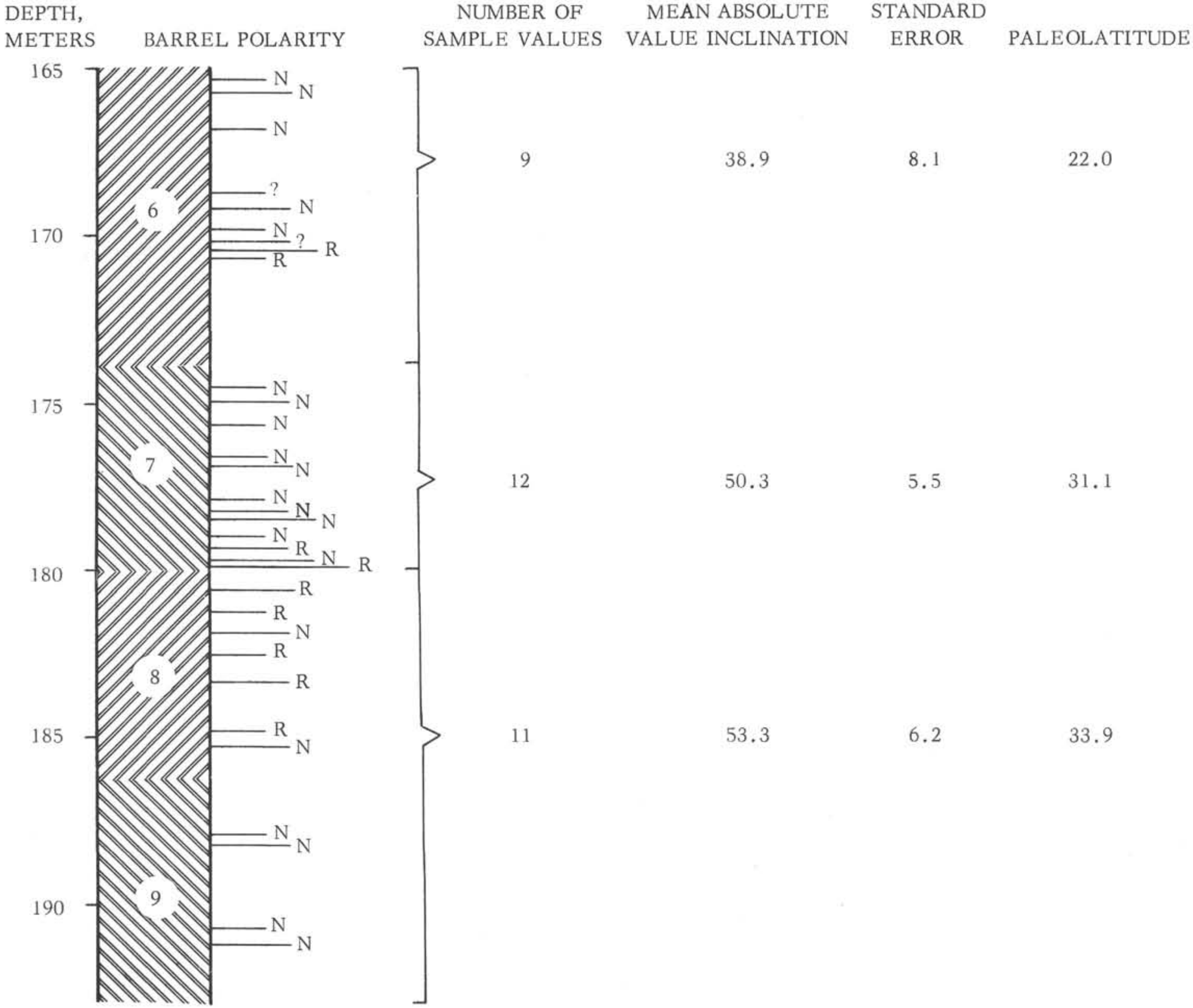
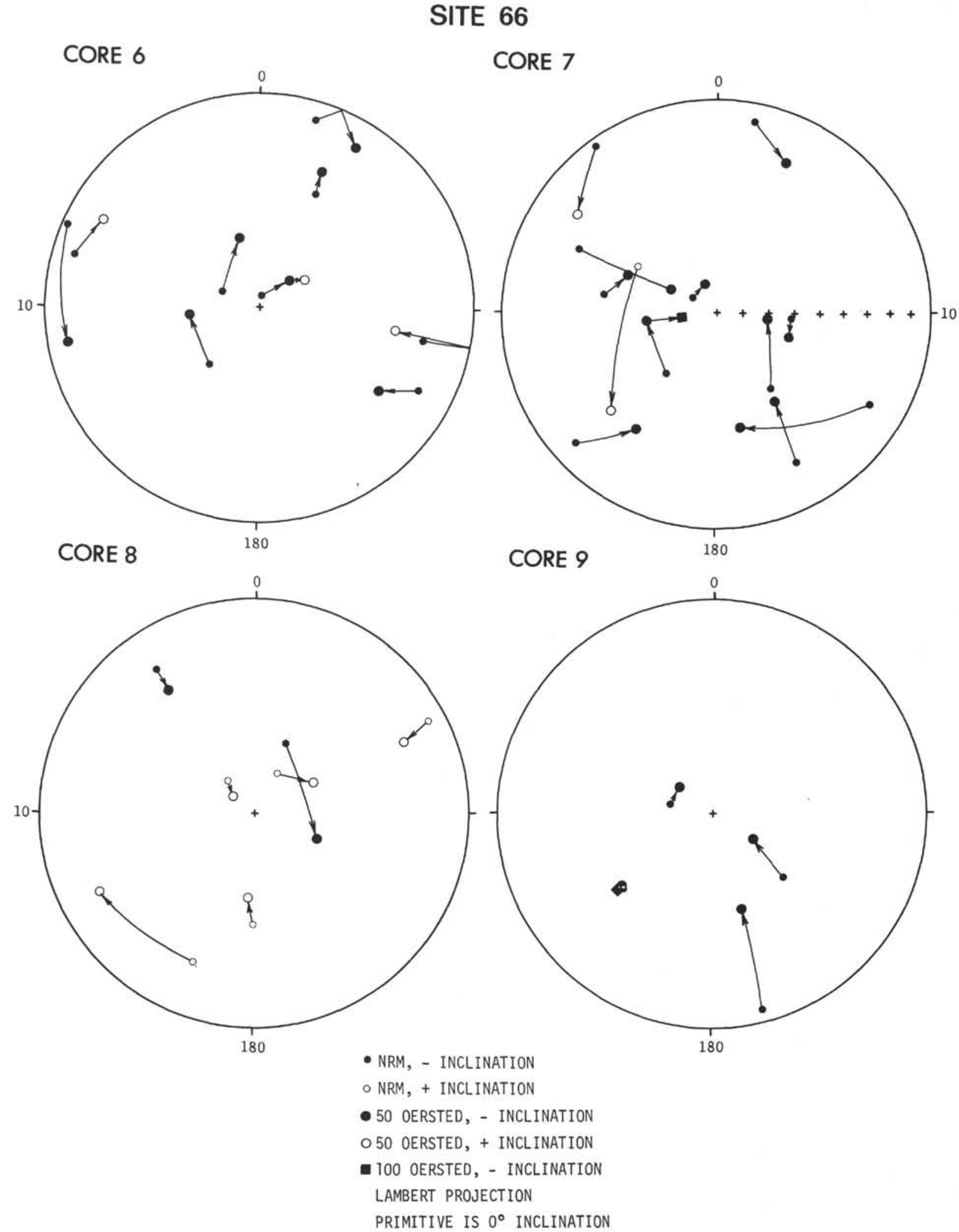


Figure 5. *Preliminary magnetic stratigraphy of the oldest sediments at Site 66.*



Figures 6-9. *Declination of samples from Hole 66-0. Hole 66-0, Core 6; Hole 66-0, Core 7; Hole 66-0, Core 8; Hole 66-0, Core 9.*

TABLE 1
Summary of Magnetic Data

Core and Section	Sampled at (cm)	Depth in Hole (m)	NRM Incl. (degrees)		NRM Decl. (degrees)		NRM Intensity (emu/cc)		50 Oersted Incl. (degrees)		50 Oersted Decl. (degrees)		50 Oersted Intensity (emu/cc)	
				Estimated Error		Estimated Error		Estimated Error		Estimated Error		Estimated Error		Estimated Error
2-1	557	79	-32.5	21.6	230.8	41.2	7.1×10^{-7}	3.5×10^{-7}	45.6	35.2	241.5	74.8	4.2×10^{-7}	2.5×10^{-7}
2-1	114	80	-34.8	97.3	271.8	63.7	5.1×10^{-7}	1.2×10^{-6}						
2-2	65	81	53.5	41.6	154.4	96.2	2.8×10^{-7}	2.1×10^{-7}						
2-2	135	82	-36.8	104.1	131.5	184.1	1.4×10^{-7}	3.1×10^{-7}						
2-3	68	83	26.8	27.1	193.5	51.8	4.0×10^{-7}	3.2×10^{-7}	47.6	46.0	197.0	42.1	5.6×10^{-7}	4.1×10^{-7}
3-1	62	118	37.5	66.4	135.0	132.8	2.1×10^{-7}	3.0×10^{-7}						
3-2	53	119	-6.1	17.6	221.8	21.5	1.2×10^{-6}	4.3×10^{-7}						
3-2	130	120	-47.8	21.0	296.3	41.5	9.3×10^{-7}	3.2×10^{-7}						
3-3	44	120	-63.5	25.2	218.1	62.8	1.2×10^{-6}	3.3×10^{-7}						
3-3	79	121	-6.2	14.7	298.7	20.1	1.2×10^{-6}	4.3×10^{-7}	39.1	68.8	201.2	106.6	1.6×10^{-7}	2.3×10^{-7}
3-3	111	121	28.2	16.2	350.0	10.0	1.4×10^{-6}	2.4×10^{-7}						
3-4	64	122	26.0	7.4	186.5	13.2	1.2×10^{-6}	2.2×10^{-7}						
3-4	140	123	-4.5	31.9	146.8	54.7	3.0×10^{-7}	2.6×10^{-7}						
3-5	60	124	-7.6	12.8	358.1	14.5	1.7×10^{-6}	4.4×10^{-7}						
3-5	84	124	22.9	13.1	182.9	13.6	1.6×10^{-6}	3.2×10^{-7}						
3-5	105	124	-14.6	12.5	160.9	19.7	1.3×10^{-6}	4.0×10^{-7}	34.9	50.7	226.1	98.7	2.2×10^{-7}	2.6×10^{-7}
3-6	42	125	27.7	19.7	61.9	35.6	7.5×10^{-7}	2.6×10^{-7}	9.3	116.1	279.5	103.4	2.0×10^{-7}	2.1×10^{-6}
3-6	101	126	13.6	31.4	264.1	14.0	3.5×10^{-6}	5.6×10^{-7}						
3-6	141	126	-56.8	20.9	252.8	43.5	2.0×10^{-6}	6.2×10^{-7}	-58.1	27.1	246.7	51.9	1.5×10^{-6}	4.9×10^{-7}
6-1	34	165	-41.4	2.3	26.5	2.2	8.2×10^{-5}	3.4×10^{-6}	-32.4	2.1	24.4	2.1	6.7×10^{-6}	2.8×10^{-7}
6-1	65	166	-74.9	11.7	293.1	72.9	1.5×10^{-5}	1.8×10^{-6}	-62.9	2.0	343.9	7.3	1.4×10^{-5}	8.3×10^{-7}
6-2	44	167	-17.1	12.5	117.9	14.8	7.9×10^{-6}	1.2×10^{-6}	-31.5	11.9	124.9	18.3	3.3×10^{-6}	7.6×10^{-7}
6-3	89	169	-10.7	13.0	16.7	13.6	1.1×10^{-5}	1.7×10^{-6}	14.5	5.9	31.3	8.6	4.1×10^{-6}	3.8×10^{-7}
6-3	122	169	-85.3	1.6	10.9	9.6	3.4×10^{-5}	2.4×10^{-6}	-74.8	8.2	48.3	32.3	2.0×10^{-5}	1.2×10^{-6}
6-4	36	170	-74.2	1.4	48.1	3.7	5.8×10^{-5}	3.3×10^{-6}	-69.5	1.7	59.1	2.4	5.1×10^{-5}	2.9×10^{-6}
6-4	61	170	-2.0	18.1	293.2	15.1	6.7×10^{-6}	1.3×10^{-6}	-11.3	12.3	260.2	11.0	1.9×10^{-6}	8.0×10^{-7}

TABLE 1 – *Continued*

Core and Section	Sampled at (cm)	Depth in Hole (m)	NRM Incl. (degrees)		NRM Decl. (degrees)		NRM Intensity (emu/cc)		50 Oersted Incl (degrees)		50 Oersted Decl. (degrees)		50 Oersted Intensity (emu/cc)	
				Estimated Error		Estimated Error		Estimated Error		Estimated Error		Estimated Error		Estimated Error
6-4	96	170	11.8	15.5	286.2	16.4	1.4×10^{-5}	3.6×10^{-6}	18.3	3.5	299.4	3.4	7.1×10^{-6}	6.4×10^{-7}
6-4	119	171	-23.3	12.6	101.5	18.1	1.5×10^{-5}	1.8×10^{-6}	35.2	5.3	109.7	4.8	4.5×10^{-6}	4.2×10^{-7}
7-1	52	175	-61.2	2.6	221.2	4.0	4.0×10^{-5}	2.6×10^{-6}	-63.0	3.6	264.2	3.9	2.0×10^{-5}	1.2×10^{-6}
7-1	98	175	-17.6	12.7	119.9	34.9	2.1×10^{-5}	7.9×10^{-6}	-44.7	3.5	167.3	3.3	1.7×10^{-5}	1.1×10^{-6}
7-2	13	176	-79.7	1.4	303.5	7.5	6.4×10^{-5}	4.5×10^{-6}	-78.3	1.0	335.4	7.1	4.4×10^{-5}	2.7×10^{-6}
7-2	115	177	-30.0	23.4	294.8	12.8	2.2×10^{-5}	6.3×10^{-6}	-70.1	2.4	297.6	3.4	2.7×10^{-5}	1.7×10^{-6}
7-2	135	177	-9.8	14.7	11.2	18.8	3.3×10^{-5}	8.4×10^{-6}	-23.5	1.7	23.9	2.3	3.3×10^{-5}	1.5×10^{-6}
7-3	97	178	-60.9	10.6	94.2	32.7	3.1×10^{-5}	4.0×10^{-6}	-60.6	1.8	105.6	3.0	2.6×10^{-5}	1.1×10^{-6}
7-3	118	178	-46.6	3.2	278.8	.8	5.9×10^{-5}	3.3×10^{-6}	-53.5	3.2	292.1	2.2	2.9×10^{-5}	1.7×10^{-6}
7-3	139	178	-23.3	1.8	150.6	1.9	4.1×10^{-5}	1.9×10^{-6}	-48.9	2.7	145.6	3.1	2.8×10^{-5}	1.3×10^{-6}
7-4	50	179	-54.0	2.8	144.4	2.9	2.0×10^{-5}	1.1×10^{-6}	-70.5	2.9	108.1	7.0	9.9×10^{-6}	5.6×10^{-7}
7-4	85	179	54.8	10.3	298.1	18.0	5.9×10^{-6}	8.4×10^{-7}	34.7	2.7	227.4	4.4	1.7×10^{-5}	9.3×10^{-7}
7-4	121	180	-12.3	1.5	227.0	3.5	3.4×10^{-5}	2.0×10^{-6}	-34.8	2.9	214.4	4.3	2.0×10^{-5}	1.2×10^{-6}
7-4	141	180	4.0	0.9	323.9	2.5	3.0×10^{-5}	1.2×10^{-6}	21.2	1.9	305.3	2.7	2.0×10^{-5}	1.1×10^{-6}
8-1	63	181	73.5	1.7	31.4	3.5	3.6×10^{-5}	2.5×10^{-6}	66.1	2.2	61.3	2.3	3.2×10^{-5}	2.1×10^{-6}
8-1	123	181	74.6	1.3	319.5	2.6	7.2×10^{-5}	5.1×10^{-6}	80.5	0.7	306.8	2.3	6.3×10^{-5}	4.3×10^{-6}
8-2	41	182	-20.6	1.7	325.1	2.2	1.1×10^{-4}	4.2×10^{-6}	-30.8	2.0	324.3	2.5	8.1×10^{-5}	2.9×10^{-6}
8-2	105	183	10.1	1.6	61.8	3.4	2.4×10^{-5}	1.2×10^{-6}	23.9	2.5	63.8	2.8	2.0×10^{-5}	1.1×10^{-6}
8-3	33	183	47.7	2.6	180.2	.6	5.4×10^{-5}	2.5×10^{-6}	57.6	2.8	184.2	1.7	3.5×10^{-5}	1.8×10^{-6}
8-4	34	185	26.5	2.4	213.0	3.0	2.3×10^{-5}	1.3×10^{-6}	20.9	2.2	243.1	3.5	2.2×10^{-5}	1.3×10^{-6}
8-4	70	185	-60.8	2.7	23.0	3.2	2.6×10^{-5}	1.4×10^{-6}	-64.9	2.0	110.1	5.7	2.6×10^{-5}	1.5×10^{-6}
9-1	93	188	-52.7	2.4	131.0	3.0	4.4×10^{-5}	2.1×10^{-6}	-72.0	2.0	123.4	7.8	2.6×10^{-5}	1.5×10^{-6}
9-1	107	188	-45.4	2.8	229.8	3.8	4.3×10^{-5}	2.1×10^{-6}	-44.9	3.0	231.7	4.0	3.9×10^{-5}	2.0×10^{-6}
9-3	66	191	-73.6	2.4	282.2	4.5	3.8×10^{-5}	2.6×10^{-6}	-73.5	1.9	304.7	4.4	3.4×10^{-5}	2.3×10^{-6}
9-3	106	191	-5.4	5.4	165.7	6.3	6.2×10^{-6}	6.7×10^{-7}	-51.6	6.9	163.7	7.0	5.7×10^{-6}	6.4×10^{-7}

TABLE 1 – *Continued*

Core and Section	Sampled at (cm)	Depth in Hole (m)	NRM Incl. (degrees)	Estimated Error	NRM Decl. (degrees)	Estimated Error	NRM Intensity (emu/cc)	Estimated Error	50 Oersted Incl. (degrees)	Estimated Error	50 Oersted Decl. (degrees)	Estimated Error	50 Oersted Intensity (emu/cc)	Estimated Error
Hole 66.1														
2-5	45	26	-13.9	13.6	289.1	17.8	2.6×10^{-6}	6.9×10^{-7}	-3.8	12.4	294.0	15.2	2.5×10^{-6}	5.8×10^{-7}
2-5	87	27	-53.9	16.0	310.0	31.2	3.5×10^{-6}	7.8×10^{-7}	-49.4	17.7	300.7	26.3	2.6×10^{-6}	7.7×10^{-7}
2-6	104	29	-42.5	15.1	311.9	26.9	2.6×10^{-6}	7.2×10^{-7}	-50.8	16.3	137.5	30.7	2.9×10^{-6}	7.3×10^{-7}
2-6	113	29	-53.8	6.9	121.2	10.5	4.3×10^{-6}	5.6×10^{-7}	-30.8	14.0	317.8	20.6	2.5×10^{-6}	7.0×10^{-7}
3-4	70	34	-33.7	14.2	269.7	22.3	3.6×10^{-6}	9.0×10^{-7}	-33.6	16.3	278.7	22.6	3.0×10^{-6}	8.5×10^{-7}
3-4	79	34	-44.0	13.6	278.9	20.7	6.1×10^{-6}	1.5×10^{-6}	-44.7	14.5	275.4	22.7	5.5×10^{-6}	1.4×10^{-6}
4-1	123	39	-19.7	24.4	217.3	18.2	2.1×10^{-6}	7.4×10^{-7}	1.5	14.4	207.3	19.7	2.2×10^{-6}	9.4×10^{-7}
4-1	131	39	30.4	2.3	112.8	1.7	4.9×10^{-5}	2.2×10^{-6}	31.3	2.3	113.5	2.0	4.9×10^{-5}	2.1×10^{-6}
4-1	144	39	1.1	11.9	260.5	21.0	1.9×10^{-6}	4.7×10^{-7}	-3.1	12.5	276.4	16.9	2.2×10^{-6}	5.2×10^{-7}
4-2	110	41	54.8	12.3	227.9	22.9	1.1×10^{-6}	2.4×10^{-7}	39.8	34.5	246.3	60.7	5.7×10^{-7}	3.5×10^{-7}
4-3	60	42	-29.5	11.2	150.2	16.7	1.7×10^{-6}	3.8×10^{-7}	-37.0	16.1	175.8	46.6	7.8×10^{-7}	2.7×10^{-7}
4-3	135	42	-68.8	20.0	276.9	50.9	2.1×10^{-6}	4.6×10^{-7}	-64.1	26.5	268.2	50.5	1.5×10^{-6}	3.9×10^{-7}
4-6	97	46	-48.9	16.8	236.0	29.0	2.4×10^{-6}	6.8×10^{-7}	-55.8	19.7	249.6	41.2	2.0×10^{-6}	5.8×10^{-7}
5-5	105	54	-27.4	17.9	173.7	29.0	1.1×10^{-6}	3.1×10^{-7}	-43.7	28.5	162.2	38.7	9.8×10^{-7}	5.0×10^{-7}
5-5	109	54	-42.1	25.5	190.1	44.3	7.6×10^{-7}	3.7×10^{-7}	-41.7	41.2	263.1	78.4	4.8×10^{-7}	3.7×10^{-7}
5-5	121	54	-64.9	24.3	282.9	51.4	1.4×10^{-6}	3.4×10^{-7}	-49.8	28.6	231.0	51.4	1.0×10^{-6}	4.8×10^{-7}
6-5	41	62	-57.5	17.0	177.8	38.4	3.0×10^{-6}	7.2×10^{-7}	-55.2	18.0	176.5	41.4	2.3×10^{-6}	5.7×10^{-7}
6-5	96	63	-27.0	17.4	167.9	18.8	2.8×10^{-6}	7.0×10^{-7}	-31.0	17.2	169.7	23.1	1.8×10^{-6}	6.6×10^{-7}
6-6	102	63	-67.2	5.7	174.5	15.7	2.9×10^{-7}	2.9×10^{-7}	-63.6	18.6	206.5	44.7	2.0×10^{-6}	5.1×10^{-7}

TABLE 2
A-F Demagnetization Results

Sample Designation	Sampled at (cm)	Depth Below Sea Floor (m)	Peak Field in Oersteds	Inclination Mean	Declination Mean	Intensity Mean	Inclination Est. σ^2	Declination Est. σ^2	Intensity Est. σ^2
66-0-3-3	79	121	NRM	-6.2	298.7	1.2×10^{-6}	14.7	20.1	4.3×10^{-7}
			50	39.1	201.2	1.6×10^{-7}	68.8	106.6	2.3×10^{-7}
			100	60.9	170.4	2.2×10^{-7}	81.3	144.0	1.9×10^{-7}
66-0-7-1	52	175	NRM	-61.2	221.2	4.0×10^{-5}	2.6	4.0	2.6×10^{-6}
			50	-63.0	264.2	2.0×10^{-5}	3.6	3.9	1.2×10^{-6}
			100	-76.6	262.6	1.1×10^{-5}	18.5	67.3	1.4×10^{-6}
66-0-9-1	107	188	NRM	-45.4	229.8	4.3×10^{-5}	2.8	3.8	2.1×10^{-6}
			50	-44.9	231.7	3.9×10^{-5}	3.0	4.0	2.0×10^{-6}
			100	-44.8	230.6	1.9×10^{-5}	19.4	26.1	6.5×10^{-6}
66-1-3-4	70	34	NRM	-33.7	269.7	3.6×10^{-6}	14.2	22.3	9.0×10^{-7}
			50	-33.6	278.7	3.0×10^{-6}	16.3	22.6	8.5×10^{-7}
			100	-54.0	257.6	2.4×10^{-6}	19.0	26.5	9.1×10^{-7}

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