38. PALEOMAGNETISM OF IGNEOUS ROCKS FROM DEEP SEA DRILLING PROJECT SITES 482, 483, AND 485[1]

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INTRODUCTION

The principal objective of DSDP Leg 65 was to sample oceanic crust near the crest of the East Pacific Rise. The sites that we drilled (Fig. 1), close to the mouth of the Gulf of California, are areas where the sedimentation rate is high and where high seismic velocities indicated that the basement could be successfully drilled. We occupied four sites (482–485) and drilled 15 holes, of which 8 reached basement. Although we attempted to drill re-entry holes at Sites 482 and 483, we lost them because of operational problems.

Lithologic columns for the principal holes are shown in Figure 2. We sampled 268 paleomagnetic cores from Sites 482, 483, and 485 (Holes 482B, 482C, 482D, 483, 483B, and 485A). The holes that were not sampled had little or no basement recovery. In the six holes that we sampled we took care to obtain a uniform sampling of the basalts with mini-cores from each lithologic unit if possible.

Many of the paleomagnetic results reported in this chapter were measured during Leg 65. Supplementary measurements were made at the University of California (Santa Barbara) using a Schönstedt spinner magnetometer and an alternating field demagnetizing unit. The Curie temperatures were measured at Ruhr-Universität, Bochum and are described in more detail in Day et al. (this volume).

GEOLOGIC SUMMARY

Site 482

Site 482 lies about 12 km east of the axis of the East Pacific Rise and about 15 km south of the Tamayo Fracture Zone. The magnetic age of the basement, overlain by about 137 meters of sediments, is about 0.5 m.y. Holes 482B, 482C, and 482D are about 100 meters apart and lie along a line that is approximately perpendicular to the ridge axis and to the axis of the sediment pond in which the site is located. Hole 482D is closest to the pond axis. Basement penetration in Holes 482B, 482C, and 482D was respectively 90, 50, and 50 meters with a recovery of 46%, 57%, and 41%. Eight lithologic units are recognized in Hole 482B, two in 482C, and four in 482D (Table 1). Most units are at least 5 meters thick, and some exceed 10 meters. They have tentatively been interpreted as submarine lava flows, but an intrusive origin has not been ruled out. Some thin units (approximately 1 m thick) were found in Hole 482D. These were also interpreted as flows.

Most basalts are aphyric to sparsely phyric with up to 5% phenocrysts, chiefly plagioclase with minor amounts of green clinopyroxene and altered olivine. The phyric basalts tend to occur in the lower parts of the basement section and are overlain by aphyric varieties. The basalts are generally medium to fine grained with an intergranular to subophitic texture. In the central part of the thicker cooling units, the basalts from Site 482 are coarse grained with a holocrystalline mesostasis. Plagioclase and well-crystallized clinopyroxene are the most abundant groundmass minerals, with plagioclase being generally more abundant. Olivine and titanomagnetites occur in all specimens (2–5%). The mesostasis is glassy (generally replaced by smectite) in the fine-grained rocks; in coarse-grained rocks it consists of tridymite(?), quartz, and apatite needles. The alteration is characteristic of low-temperature interaction between basalt and seawater, with probable deuteric alteration in the thicker flows. Higher-temperature hydrothermal(?) alteration occurs in some specimens (e.g., Section 482C-11-2, upper part).

Site 483

Site 483 is located about 52 km west of the East Pacific Rise and about 25 km east of the base of the continental slope off Baja California. The magnetic age of the basement is between 1.5 and 2.0 m.y. (Matuyama Reversed Epoch), and it is overlain by 110 meters of sediments. Hole 483 penetrated 94.5 meters of basement with 40% recovery. Hole 483B, drilled 100 meters east of Hole 483, penetrated 157 meters with 48% recovery (Table 1).

The upper part of the basement consists of interlayered massive basalts and sediments. Sediment layers up to 9 meters thick compose nearly 50% of the upper 50 meters, but below this level the amount of sediment decreases markedly, and the basement then consists largely of interlayered pillow and massive basalts. The massive basalts in the lower part of the section are again interpreted as submarine flows. Pillow basalts first appear at a sub-bottom depth of about 178 meters.

Both phyric and aphyric basalts occur at this site. The most common phenocryst assemblages in the phyric varieties are plagioclase (with minor olivine), plagioclase + olivine, and plagioclase + olivine + clinopyroxene. Plagioclase and olivine are the most common phases, usually occurring as euhedral to subhedral crystals. Clino-

[1] Lewis, B. T. R., Robinson, P., et al., *Init. Repts. DSDP*, 65: Washington (U.S. Govt. Printing Office).

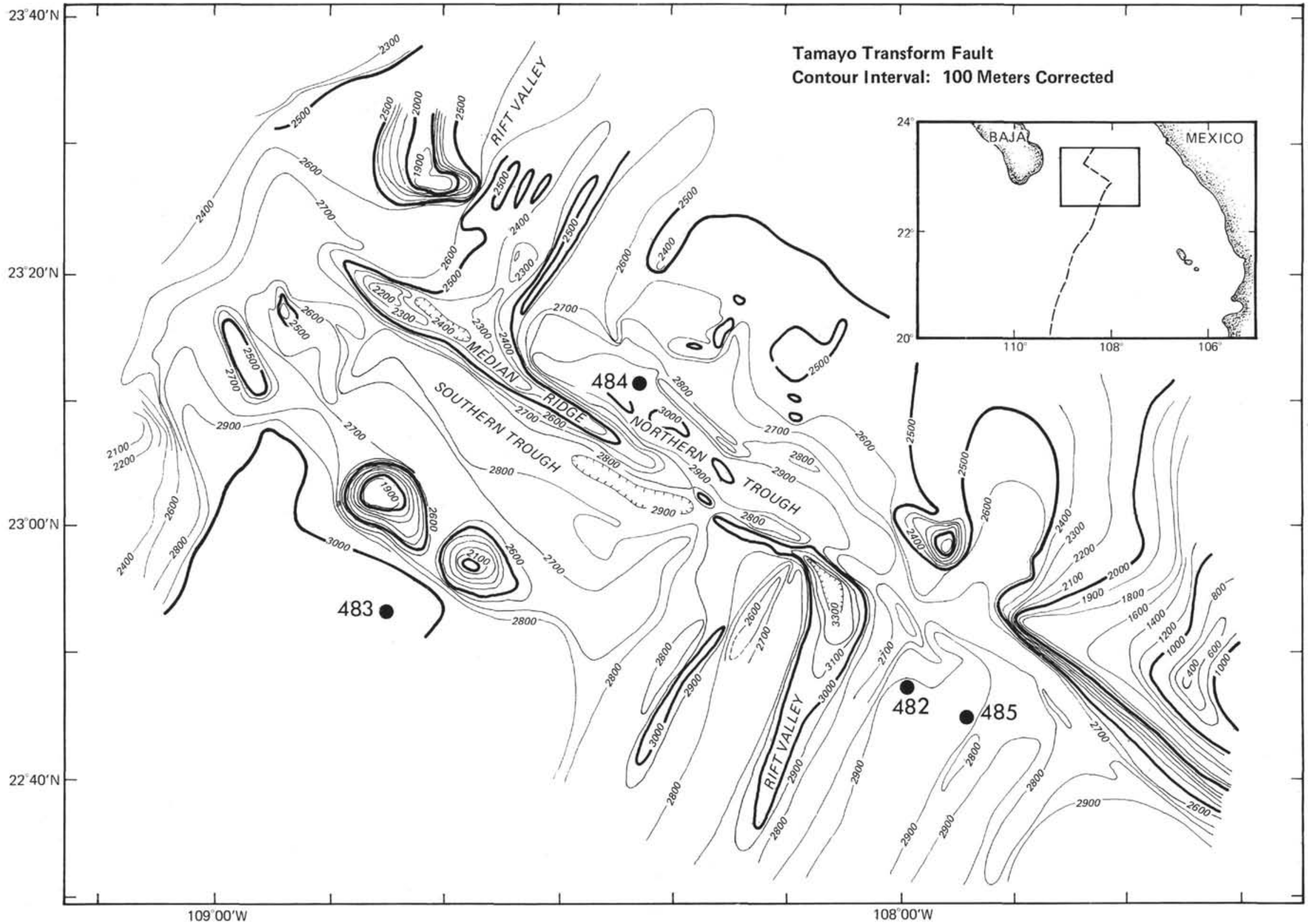

Figure 1. Locations of Leg 65 drilling sites. (Contour interval = 100 m, corrected.)

pyroxene occurs as anhedral intergrowths, with plagioclase in glomeroporphyritic clots or as single rounded crystals, some of which have well-developed sector zoning. The partly resorbed nature of some of the phenocrysts and the presence of small spinel inclusions in some olivine phenocrysts suggest two stages of crystallization, one at pressures above about 5 kb and a later one at shallower levels.

The alteration is similar to that occurring at Site 482. An early pervasive alteration resulted in the replacement of olivine and interstitial glass by smectite and minor carbonate. Veins are filled with, or partly altered to, smectite, carbonate, and zeolite. One patch of higher grade alteration (Section 483B-8-2) is indicated by the presence of chlorite and actinolite(?) replacing clinopyroxene. The amount of alteration increases slightly with depth, but we noticed no systematic change in alteration grade.

The upper four massive units in Holes 483 and 483B are chemically distinct from those below, which are considerably more fractionated.

Site 485

Site 485 is about 20 km east of the East Pacific Rise. The magnetic age of the basement is about 0.74 m.y. (Matuyama Reversed Epoch), whereas fossil data give a rough estimate of less than 1.2 m.y. The basement penetration in Hole 485A was about 177 meters with a recovery of 50% (Table 1).

The massive basalts in Hole 485A are similar to those found at the other sites except that they are often thicker, are sometimes much more coarse-grained, and have better evidence of intrusive contacts. Eight lithologic units were identified, with possible baked contacts at the top of Units 4, 7, and 8 and coarse-grained gabbroic textures in Units 4 and 8 similar to those expected from slow cooling in a sill. The basalts are sparsely to moderately phyric with mainly plagioclase and olivine phenocrysts; minor clinopyroxene and spinel sometimes occur in glomeroporphyritic clots with plagioclase. The coarse-grained basalts have ophitic gabbroic textures and are characterized by the presence of both pigeonite and augite, as well as interstitial groundmass quartz. Compositionally, the basalts are more uniform than at the other Leg 65 sites.

Most of the basalts exhibit low-temperature alteration, characterized by the replacement of olivine and interstitial glass by smectite and minor carbonate. Veins and sparse vesicles are usually filled with smectite, carbonate, and pyrite; more rarely, they contain minor epidote. The coarse-grained rocks exhibit extensive evidence of deuteric alteration, and, in some basalts, chlorite replaces smectite, suggesting some higher-temperature, hydrothermal alteration.

PALEOMAGNETIC RESULTS

Site 482

The paleomagnetic results from Site 482 appear in Table 2. In general the natural remanent magnetization (NRM) is relatively soft (the average median destructive field [MDF] is approximately 50 Oe), and the alternating field demagnetization curves are characterized by a rapid decrease in intensity during the first 25–50 Oe whereas the inclination rotates from a steep value to a shallow value. The stable inclination (I_0) often was not obtained until the NRM was demagnetized to well below the MDF. The NRM intensity is usually greater than the mean value for oceanic basalts, however, and the Koenigsberger ratio (Q) is almost always greater than 1.

Hole 482B

We sampled eight lithologic units from Hole 482B, although some (Units 3 and 8) were only sparsely sampled. In general, the magnetic delineation between the units agrees with the lithological classification, though in some cases there are grounds for disagreement. Unit 1 has a mean stable inclination of 33°, a value close to the axial dipole inclination of 39°. The bottom three samples of Unit 1, however, have shallower inclinations similar to those in Unit 2. The NRM intensities of these samples are more like those in Unit 1. One could argue that these samples belong to Unit 2, but another assumption might be that they were reheated above their Curie point by the intrusion of Unit 2 below Unit 1; this would be consistent with the fact that there was no sedimentary intercalation between these units. An intrusive origin for Unit 2 would also explain the wide variability in inclination observed in this unit and the lower NRM intensities. These are characteristic of a slowly cooled intrusive body. Units 3 to 7 are characterized by steeper inclinations than the upper two units, and there is much less variability in their stable inclinations. The Curie temperatures are consistent with the assertion that the magnetic mineral is a slightly altered, single phase, high-titanium titanomagnetite. The exception occurs in the middle of Unit 2 where the double Curie point in Table 2 may indicate deuteric oxidation.

Hole 482C

We sampled two units in Hole 482C. Though the mean stable inclination of Unit 1 (Table 2) is the same as that of Unit 1, Hole 482B, the NRM intensity is much lower. Again, Unit 2 shows a wide range of stable inclinations, and the NRM values are much lower than those in Unit 2, Hole 482B. In this hole there is a good agreement between the magnetic delineations and the lithologic units. Although there are only five Curie temperature measurements in this hole, there is a general decrease from high values at the top of the basement to lower values toward the middle of the recovered section. This could be the consequence of hydrothermal systems in the upper basement that cannot penetrate the lower sections.

Hole 482D

We sampled four units, including a unit of pillow basalts (Unit 3) from Hole 482D. The NRM intensities are intermediate in value between those in basalts from the other holes at this site. The stable inclinations in-

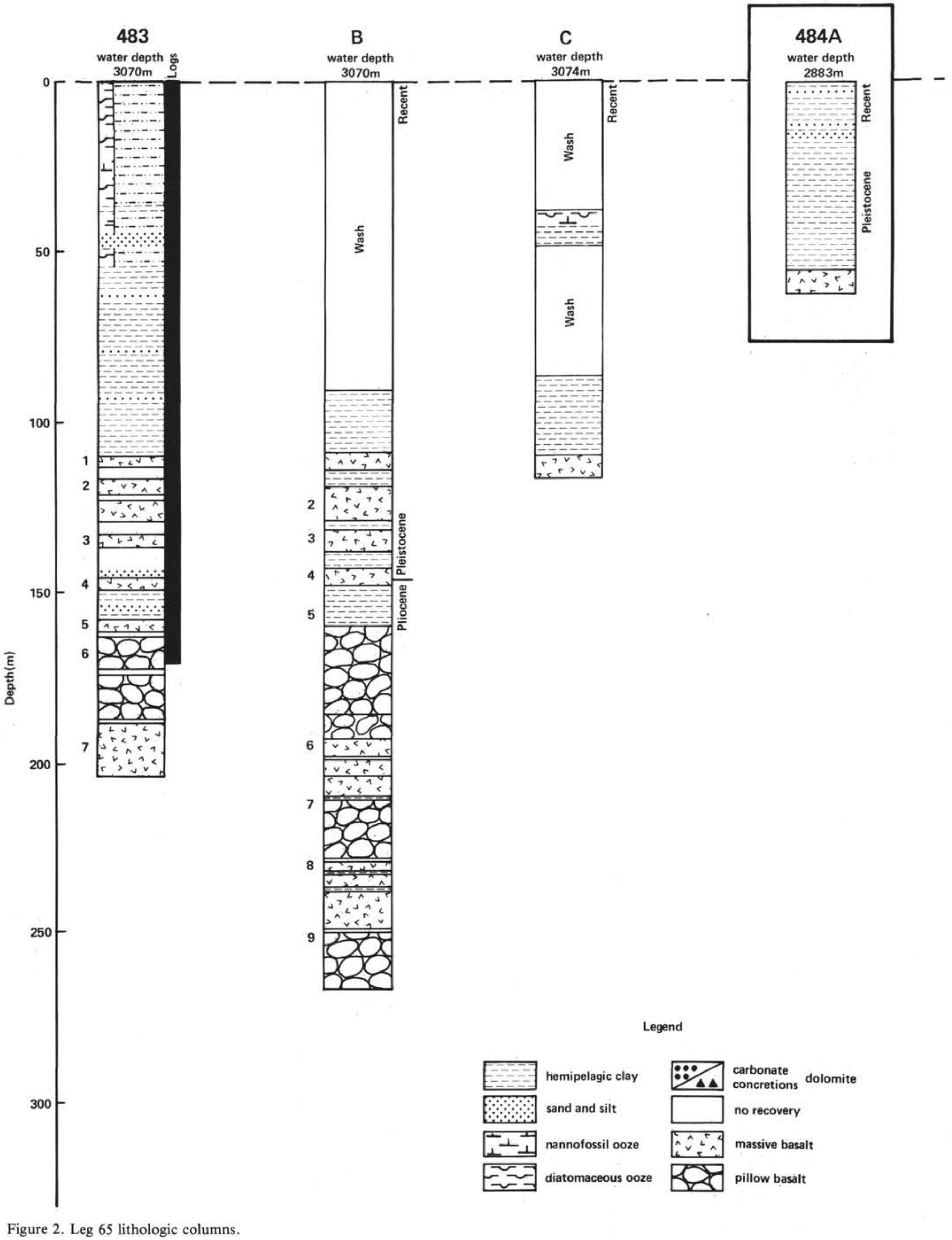

Figure 2. Leg 65 lithologic columns.

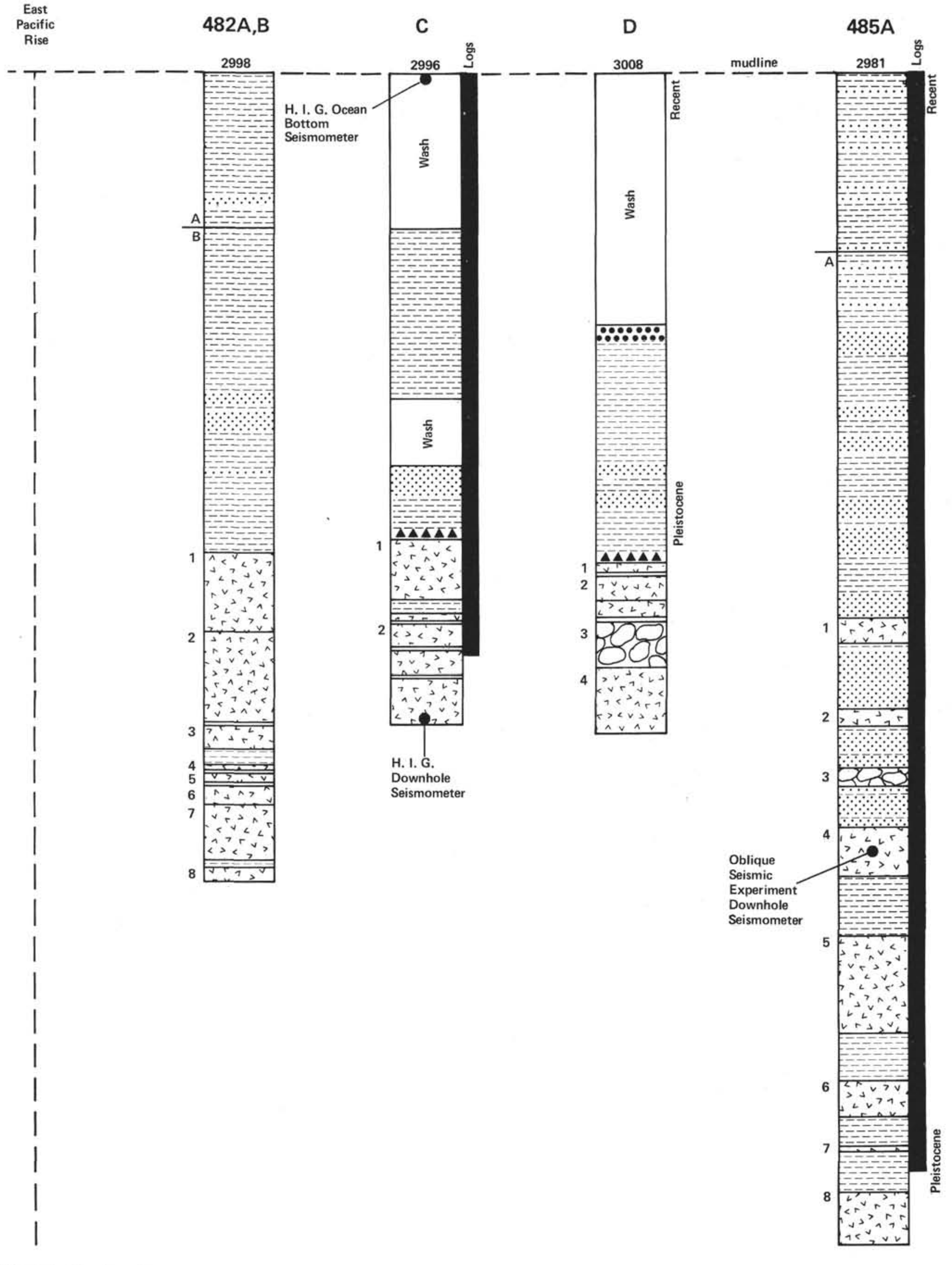

Figure 2. (Continued).

Table 1. Basement lithologic units.

Unit	Top (m) A	Top (m) B	Base (m) A	Base (m) B	Thickness (m) A	Thickness (m) B	Type Cooling Unit	Phenocryst Assemblage	Core-Section (level in cm)
Hole 482B									
1	136.5	136.5	158.0	158.0	21.5	21.5	Massive basalt	Aphyric	10-7, 8 to 15-1, 115
2	158.0	158.0	174.7	184.0	16.7	26.0	Massive basalt	Plagioclase	15-1, 115 to 17-2, 150
	Sedimentary intercalation								
3	184.1	185.5	186.2	191.5	2.1	6.0	Massive basalt	Plagioclase	18-1, 90 to 18-2, 107
	Sedimentary intercalation								
4	193.5	195.0	199.5	199.5	6.0	4.5	Massive basalt	Plagioclase	19-1, 60 to 20-2, 83
5	199.5	199.5	201.5	201.5	2.0	2.0	Massive basalt	Plagioclase-Clinopyroxene	20-2, 83 to 20-3, 130
6	201.5	201.5	205.0	207.0	3.5	5.5	Massive basalt	Plagioclase-Clinopyroxene-Olivine	20-3, 130 to 21-3, 50
7	205.0	207.0	220.3	223.0	15.3	16.0	Massive basalt	Plagioclase-Clinopyroxene-Olivine	21-3, 50 to 23-1, 30
	Sedimentary intercalation								
8	224.7	225.0	229.0	229.0	4.3	4.0	Massive basalt	Aphyric	24-1, 25 to 24-3, 130
Hole 482C									
1	135.5	—	157.0	—	21.5	—	Massive basalt	Aphyric	9-1, 60 to 11-4, 150
2	157.0	—	184.0	—	27.0	—	Massive basalt	Plagioclase-(Clinopyroxene)-(Olivine)	12-1, 0 to 15-4, 145
Hole 482D									
1	138.0	138.0	139.6	141.5	1.6	3.5	Massive basalt	Aphyric	8-1, 0 to 8-2, 30
	Sedimentary intercalation								
2	141.7	142.5	154.0	154.0	12.3	11.5	Massive basalt	Aphyric	9-1, 15 to 10-3, 60
	Sedimentary intercalation								
3	154.1	154.5	169.6	167.5	15.5	13.0	Pillow basalt?	Aphyric	10-3, 65 to 12-1, 130
4	169.6	167.5	186.5	186.5	16.9	19.0	Massive basalt	Plagioclase	12-1, 130 to 13-3, 35
Hole 482F									
1	136.2	—	145.0	—	8.8	—	Massive basalt	Aphyric	4-3, 117 to 5-2, 30
Hole 483									
1	110.0	110.0	111.0	114.0	1.0	4.0	Massive basalt	Plagioclase-Olivine	13-4, 5 to 13-4, 95
	Sedimentary intercalation?								
2	115.0	117.0	127.0	129.0	12.0	12.0	Massive basalt	Aphyric	14-1, 5 to 15-2, 128
	Sedimentary intercalation?								
3	127.0	132.0	135.8	137.0	8.8	5.0	Massive basalt	Aphyric	15-2, 128 to 16-3, 12
	Sedimentary intercalation								
4	142.2	145.5	145.0	149.0	2.8	3.6	Massive basalt	Aphyric	17-1, 18 to 17-3, 24
	Sedimentary intercalation								
5	156.5	158.0	160.1	161.0	3.6	3.0	Massive basalt	Aphyric	18-4, 130 to 19-1, 10
	Sedimentary intercalation?								
6a	—	163.0	—	171.0	—	8.0	Pillowed basalt?	Not Recovered	
	Sedimentary intercalation?								
6b	169.0	174.0	186.5	186.5	17.5	12.5	Pillow basalt	Plagioclase-Olivine-Clinopyroxene	20-1, 5 to 22-4, 60
6c	186.5	186.5	188.5	188.5	2.0	2.0	Massive basalt	Plagioclase-Olivine	22-4, 60 to 23-2, 20
6d	188.5	188.5	190.0	190.5	1.5	2.0	Pillow basalt	Plagioclase-Olivine (Clinopyroxene)	23-2, 20 to 23-2, 150
	Sedimentary intercalation?								
7a	191.5	191.5	200.3	200.2	8.8	8.7	Massive basalt	Plagioclase-(Olivine)	24-1, 5 to 26-1, 40
	Sedimentary intercalation								
7b	200.4	201.0	204.5	204.5	4.1	3.5	Massive basalt	Plagioclase	26-1, 50 to 26-3, 150
Hole 483B									
1	110.0	110.0	111.3	112.0	1.3	2.0	Massive basalt	Plagioclase-Olivine	2-7, 0 to 3-1, 75
	Sedimentary intercalation?								
2	111.3	116.0	127.0	130.0	15.7	14.0	Massive basalt	Aphyric	3-1, 75 to 4-7, 20
	Sedimentary intercalation								
3	133.0	132.0	136.4	137.5	3.4	5.5	Massive basalt	Aphyric	7-1, 7 to 7-3, 75
	Sedimentary intercalation								
4	137.6	142.5	146.8	148.0	9.2	5.5	Massive basalt	Aphyric	8-1, 10 to 9-1, 44
	Sedimentary intercalation								
5	169.0	160.5	184.6	189.0	15.6	28.5	Pillow basalt	Plagioclase-Olivine-Clinopyroxene	12-1, 0 to 15-1, 6
	Sedimentary intercalation								
6a	194.0	191.0	197.3	199.0	3.3	8.0	Massive basalt	Aphyric	17-1, 0 to 17-3, 45
	Sedimentary intercalation?								
6b	199.0	200.0	204.6	204.6	5.6	4.6	Massive basalt	Aphyric	18-1, 0 to 19-1, 65
	Sedimentary intercalation(?)								
6c	204.6	204.6	206.2	206.2	1.6	1.6	Massive basalt	Aphyric	19-1, 65 to 19-2, 85
6d	206.2	206.5	210.5	210.5	4.3	4.0	Massive basalt	Plagioclase-Olivine-(Clinopyroxene)	19-2, 85 to 20-2, 65
	Sedimentary intercalation								
7a	211.1	211.1	213.0	213.0	1.9	1.9	Pillow basalt	Plagioclase-Olivine	20-2, 130 to 20-3, 30
7b	213.0	213.0	227.7	227.7	14.7	14.7	Pillow basalt	Plagioclase-Clinopyroxene-Olivine	21-1, 0 to 24-1, 145
	Sedimentary intercalation?								
8a	227.7	228.8	232.4	232.4	4.7	3.6	Massive basalt	Plagioclase-Clinopyroxene-Olivine	24-1, 145 to 25-2, 5
	Sedimentary intercalation								
8b	232.6	233.8	236.9	238.5	4.3	4.7	Massive basalt	Plagioclase-Olivine	25-2, 20 to 26-1, 150
	Sedimentary intercalation								
8c	237.0	238.7	249.5	249.5	12.5	10.8	Massive basalt	Plagioclase-Olivine	26-2, 5 to 29-1, 65
	Sedimentary intercalation?								
9	249.5	251.6	267.0	267.0	17.5	15.4	Pillow basalt	Plagioclase-Olivine-Clinopyroxene	29-1, 65 to 32-3, 82
Hole 483C									
1	109.5	—	114.0	—	4.5	—	Massive basalt	Aphyric	4-2, 47 to 4-5, 120

Table 1. (Continued).

Unit	Top (m) A	Top (m) B	Base (m) A	Base (m) B	Thickness (m) A	Thickness (m) B	Type Cooling Unit	Phenocryst Assemblage	Core-Section (level in cm)
Hole 484A									
1	59.5	—	62.0	—	2.5	—	Basalt	Plagioclase-Olivine	7-1, 0 to 7-1, 6
Hole 485A									
1	153.5	153.5	159.4	160.7	5.9	7.2	Massive basalt	Plagioclase-(Olivine)-(Clinopyroxene)	11-3, 55 to 14-1, 65
	Sedimentary intercalation?								
2	180.5	179.3	184.0	183.7	3.5	4.4	Massive basalt	Plagioclase	17-1, 0 to 18-1, 58
	Sedimentary intercalation								
3	201.5	195.8	201.5	201.0	0.03	5.2	Pillow basalt?	Plagioclase	22-1, 0 to 22-1, 3
	Sedimentary intercalation								
4	212.0	212.5	226.2	226.4	14.2	13.9	Massive basalt	Plagioclase-Olivine	23-1, 50 to 26-1, 20
	Sedimentary intercalation								
5	239.5	243.6	270.4	270.7	30.9	27.1	Massive basalt	(Plagioclase)	29-1, 0 to 33-2, 95
	Sedimentary intercalation								
6	277.5	284.5	294.0	294.5	16.5	10.0	Massive basalt	(Plagioclase)-(Olivine)	34-1, 56 to 35-6, 55
	Sedimentary intercalation								
7	298.6	303.2	298.7	304.2	0.1	1.0	Massive basalt	Plagioclase	36-3, 64 to 36,CC, 31
	Sedimentary intercalation								
8	314.5	315.0	328.5	331.0	14.0	16.0	Massive basalt	Plagioclase	38-2, 2 to 39-5, 60

Note: A = calculated from core log and corrected for spacers; B = calculated from drilling rate log or downhole logs.

dicate that Units 1 and 2 could be equivalent to Unit 1 in Holes 482B and 482C and that Unit 4 could be the same as Unit 2 in Holes 482B and 482C.

Site 482 Summary

The paleomagnetic properties of Site 482 basalts are similar to those of other basalts in the Pacific basement. They are only slightly altered, but this is to be expected given their young age. The NRM intensity is higher than anticipated, but the stability is remarkably low (cf. Day et al., 1979) compared to similar rocks from the Atlantic Ocean. In general, the properties are uniform throughout each hole and among the three holes at Site 482.

Site 483

The paleomagnetic results from Site 483 are listed in Table 2. The massive basalts show magnetic properties similar to those of the massive basalts at Site 482. The pillow basalts, however, have very high NRM intensities and Q values and are much more stable under AF demagnetization. The stable inclinations are negative, consistent with both the surface magnetic anomaly over the site and the expected age of the basement (Matuyama), and cluster around the value for the axial dipole geomagnetic field (−39°).

Hole 483

We sampled seven units from Hole 483, but none from Subunit 6a. The magnetic delineations agree with the lithologic units, and in general the variations within units are less than the variations among units. The lack of stable inclination variations within the units indicates that the basement at Site 483 was formed faster than that at Site 482. The NRM intensities of the lower massive basalts are much higher than the upper basalt intensities. Although these basalts are chemically distinct, it is not clear whether the different magnetic properties are due to composition or to differences in grain size.

Hole 483B

Although we analyzed nine units in Hole 483B, many were represented by only one or two paleomagnetic samples. This makes it difficult to compare this hole with Hole 483. It is apparent, however, that the NRM intensities at this site (particularly of the pillow basalts) are much lower than are those in Hole 483. This is troublesome because samples from this hole were measured 16 months after samples from Hole 483. This could be indirect evidence for a soft component of magnetization induced by drilling, which was present in the Hole 483 samples, but decayed before the samples from Hole 483B were measured. The stable inclinations in this hole are shallower than those measured in Hole 483. Thus far we have no explanation for this.

Site 483 Summary

We measured properties of both massive and pillow basalts at this site. The NRM intensities of the pillows are higher than those of the massive basalts. The stable inclinations at the site cluster around the axial dipole inclination (−39°), although the samples from Hole 483B exhibit much shallower inclinations than do those from Hole 483.

Site 485

Hole 485A

We studied six of the eight units at Site 485. The coarse-grained character of the massive basalts in Units 1 to 6 is not reflected in their paleomagnetic properties, which are not unlike those of massive basalts from the other sites. In fact the variability of the stable inclination in Unit 5 is very small, but the Curie temperature in this unit is high. Since it is likely that this unit has been deuterically altered, we cannot be confident that we are interpreting the paleomagnetic inclinations correctly.

Table 2. Paleomagnetic results from Sites 482, 483, and 485.

Core-Section (level in cm)	Lithologic Unit	NRM ($\times 10^{-3}$ gauss)	I_0 (°)	MDF (Oe)	χ ($\times 10^{-3}$ gauss)	Q	T_c (°C)	Remarks
Hole 482B								
11-1, 21	1	9.37	40		2.87	7.3		
11-2, 41	1	7.43	35	68	2.76	6.0	208	
11-3, 15	1	9.75	40	35	3.18	6.8	108	
12-1, 63	1	26.4	32	50	1.96	30.0		
12-1, 89	1	24.4	39	TD				
12-2, 143	1	18.9	31	40	2.57	16.3	144	
13-1, 126	1	10.1	33	62	2.33	9.7		
14-1, 97	1	17.2	25	317	0.55	69.6	234	
14-3, 126	1	13.8	28	47	1.57	19.6		
15-1, 16	1	19.1	24	68	1.25	34.0		
Mean	1	15.6	33	86	2.11	22.0	—	Massive basalt
15-2, 39	2	10.2	25	48	1.89	12.0		
15-3, 114	2	8.61	28	32	2.26	8.5		
15-4, 125	2	5.85	26		2.44	5.3		
16-1, 31	2	10.3	26	30	2.28	10.0		
16-1, 56	2	10.7	30?	TD				
16-1, 84	2	10.9	20	37	2.39	10.1		
16-1, 100	2	12.3	12	80	2.00	13.6		
16-1, 117	2	11.5	2	110	1.93	13.2	260/527	
16-2, 54	2	6.69	25	TD				
16-2, 87	2	5.11	29	47	2.19	5.2		
16-3, 78	2	4.07	50	35	2.69	3.4	166	
16-4, 42	2	6.33	41	41	2.56	5.5		
16-4, 125	2	7.10	24	35	2.38	6.2		
17-1, 70	2	4.79	30	50	2.30	4.6		
17-2, 55	2	6.29	27	70	2.53	5.5	195	
17-2, 143	2	13.9	54?	TD				
Mean	2	8.41	28	51	2.30	7.9		Massive basalt
18-1, 16	3	7.69	36	38	2.13	8.0		
18-1, 97	3	4.15	41	TD				
18-2, 84	3	15.0	51	63	2.00	16.7		Massive basalt
19-1, 78	4	20.2	54	68	2.32	19.4		
19-1, 108	4	11.3	−53*	59	2.95	8.5		
19-1, 134	4	11.2	−45*	68	2.97	8.4		
20-1, 39	4	8.75	53	40	2.58	7.6		
20-1, 143	4	10.7	53	35	2.50	9.5		
Mean	4	12.45	52	54	2.66	10.7		Massive basalt
20-3, 17	5	14.1	50	47	2.28	13.8		Massive basalt
20-3, 141	6	19.6	53	37	2.45	17.7		
21-1, 95	6	12.5	44	44	2.42	11.4		
21-2, 33	6	6.72	58	40	2.69	5.6		
21-2, 78	6	8.24	53	35	2.54	7.2		
21-2, 111	6	6.79	55	39	2.67	5.6		
Mean	6	10.77	53	39	2.55	9.5		Massive basalt
21-3, 69	7	15.8	54	41	2.18	16.1		
22-1, 83	7	19.0	49	32	2.28	18.6		
22-2, 32	7	13.5	53	40	2.38	12.6	195	
22-3, 99	7	14.9	41	47	1.89	17.6		
22-4, 57	7	6.46	53	47	2.40	6.0		
Mean	7	13.9	50	41	2.23	14.2		Massive basalt
24-1, 43	8	6.33	43	57	3.01	4.7		
24-2, 106	8	6.57	47	45	3.45	4.2		
24-3, 70	8	6.40	47	57	3.43	4.2	227	Massive basalt
Mean	—	11.18	39	55	2.50	12.2	—	
Hole 482C								
9-1, 113	1	3.61	30	55	4.74	1.7		
9-1, 138	1	5.59	31	81	3.28	2.4		
10-2, 58	1	4.27	27	57	3.57	2.7	424	
10-2, 61	1	4.02	28	53	3.62	2.5		
10-2, 78	1	4.10	30	64	3.87	2.4		
10-3, 119	1	4.07	−30*	70	3.34	2.6		
11-1, 97	1	2.08	28	41	2.16	2.1	371	
11-2, 11	1	5.30	37	66	2.70	4.4		
11-2, 44	1	0.55	36	55	1.34	0.9		
11-2, 116	1	5.92	25	TD	2.83	4.6		
11-3, 26	1	4.74	35	62	3.25	3.2		
11-3, 63	1	4.05	36	54	3.33	2.7		
11-3, 128	1	4.53	38	54	3.09	3.3		
11-4, 107	1	5.26	37	59	2.75	4.3		
Mean	1	4.15	32	59	3.13	3.06		Massive basalt
12-1, 39	2	3.58	12	45	2.70	2.9		
12-1, 146	2	3.39	14	34	2.61	2.9	197	
12-2, 92	2	3.30	11	45	2.40	3.1		
13-1, 56	2	5.96	11	50	2.33	5.7		
13-2, 17	2	3.28	11	72	2.17	3.4		
13-2, 96	2	2.62	9	81	2.28	2.6		
13-3, 2	2	2.10	29	TD	2.51	1.9		
13-3, 25	2	3.07	27	37	2.43	2.8		
13-3, 80	2	2.60	26	30	2.91	2.0		
13-3, 132	2	2.80	19	53	2.85	2.2		
14-1, 44	2	4.90	7	73	2.76	3.9	164	
14-2, 22	2	4.25	13	46	2.38	4.0		
14-2, 131	2	5.02	11	43	2.52	4.4		
14-3, 77	2	3.68	17	33	2.71	3.1		
14-3, 122	2	2.63	27	35	2.53	2.3		

Table 2. (Continued).

Core-Section (level in cm)	Lithologic Unit	NRM ($\times 10^{-3}$ gauss)	I_0 (°)	MDF (Oe)	χ ($\times 10^{-3}$ gauss)	Q	T_c (°C)	Remarks
Hole 482C (cont.)								
14-4, 61	2	2.49	32	43	2.58	2.1		
14-4, 132	2	2.46	27	29	2.92	1.9		
14-5, 46	2	2.10	36	50	2.42	1.9		
15-1, 42	2	2.76	18	50	2.37	2.6	229	
15-1, 103	2	3.77	20?	TD	2.29	3.7		
15-2, 11	2	8.35	18	40	1.98	9.4		
15-2, 92	2	5.43	15	45	2.23	5.4		
15-4, 68	2	3.42	14-18	50	2.44	3.0		
15-4, 117	2	3.68	21	37	2.52	3.3		
Mean	2	3.65	19	46	2.49	3.4		Massive basalt
Mean	—	3.92	23	51	2.75	3.3	—	
Hole 482D								
8-1, 10	1	4.39	24	385	1.80	5.6	519	
8-1, 39	1	0.89	30	TD				Massive basalt
9-1, 51	2	3.96	25	490	1.75	5.0		
9-2, 54	2	4.47	21	TD	2.95	3.6		
9-2, 106	2	6.74	26	229	3.15	4.7		
9-3, 23	2	6.16	25	108	3.27	4.2		
9-3, 54	2	5.88	26	109	2.95	4.4		
10-1, 69	2	17.0	40	78	3.41	11.1		
10-2, 11	2	8.81	31	85	3.24	6.0		
10-2, 57	2	4.76	32	50	3.35	3.2	326	
10-2, 111	2	3.53	41	61	3.11	2.5		
10-3, 18	2	3.48	37	58	3.25	2.4		
Mean	2	6.48	30	141	3.04	4.7		Massive basalt
10-3, 109	3	15.92	16	145	1.08	32.9		
11-1, 128	3	15.88	22	107	1.17	30.2		
11-2, 101	3	8.78	18	TD	1.41	13.8		
11-3, 80	3	10.25	24	68	1.28	16.5	190	
12-1, 27	3	4.50	13	59	1.95	5.1		
12-1, 65	3	5.82	19	53	1.97	6.6		
12-1, 119	3	6.00	30	50	1.71	7.8	155	
Mean	3	9.59	20	80	1.51	16.1		Pillow basalt?
12-2, 86	4	20.4	2	80	2.18	20.8		
12-3, 21	4	10.2	4	57	1.88	12.0		
12-3, 61	4	11.5	5	55	2.28	11.2		
12-3, 122	4	3.25	9	75	2.65	2.7		
12-4, 45	4	17.99	6	62	2.06	19.4		
13-1, 104	4	5.01	4	TD				
13-1, 127	4	6.99	14	45	2.08	7.5		
13-2, 12	4	9.66	18	77	1.82	11.8	258	
13-3, 33	4	2.41	25	52	2.62	2.0		
Mean	4	9.71	10	63	2.20	10.9		Massive basalt
Mean	—	8.45	21	110	2.26	10.4	—	
Hole 483								
13-4, 13	1	6.63	32	68	2.40	6.1		
13-4, 89	1	5.91	36	65	2.76	4.8		Massive basalt
14-1, 31	2	5.33	−23	55	2.31	5.1		
14-1, 83	2	4.28	−29	94	2.12	4.5		
14-2, 10	2	5.25	−26	75	1.91	6.1		
14-2, 53	2	2.47	−18	75	2.13	2.6		
14-2, 106	2	3.92	−21	110	2.43	3.6		
15-1, 20	2	3.03	?	18	2.46	2.7		
15-1, 102	2	2.23	−16	57	2.03	2.4		
15-2, 99	2	3.01	−11	45	2.36	2.8		
Mean	2	3.69	−20	66	2.22	3.7		Massive basalt
15-3, 4	3	3.42	−36	80	2.51	3.0		
16-1, 54	3	3.62	−38	67	2.42	3.3		
16-1, 112	3	1.21	−34	107	2.36	0.9		
16-1, 138	3	2.38	−34	70	2.37	2.2		
16-2, 14	3	2.53	−26	59	2.62	2.1	182	
16-2, 62	3	3.98	−34	81	2.35	3.8		
16-2, 140	3	1.85	−36	100	2.34	1.8		
Mean	3	2.71	−34	81	2.42	2.4		Massive basalt
17-1, 60	4	1.59	−40	91	1.24	2.8		
17-1, 101	4	1.65	−41	TD	1.17	3.1		
17-2, 30	4	1.46	−40	90	1.29	2.5		
17-2, 96	4	2.71	−40	96	1.18	5.1		
17-3, 20	4	1.85	−44	130	1.14	3.6		
Mean	4	1.85	−41	102	1.20	3.4		Massive basalt
18-4, 110	5	2.03	49	75	1.23	3.7		
18-4, 148	5	2.72	−22	85	2.21	2.7		Massive basalt
20-1, 14	6b	18.9	−48	102	2.30	18.3		
20-1, 110	6b	19.4	−42	138	1.22	35.4	158	
20-1, 142	6b	18.8	−44	100	1.73	24.0		
20-2, 22	6b	12.4	−48	122	2.12	13.0		
21-1, 29	6b	21.1	−43	82	1.61	29.1		
21-1, 106	6b	7.32	−47	138	2.31	7.0		
21-2, 4	6b	17.3	−50	80	1.99	19.3		
21-2, 39	6b	18.7	−47	130	1.24	33.6		
21-2, 124	6b	12.3	−50	90	1.89	14.5		
21-3, 56	6b	14.7	?	TD	2.06	15.8		
22-1, 84	6b	24.4	−39	155	6.92	59.2		

Table 2. (Continued).

Core-Section (level in cm)	Lithologic Unit	NRM ($\times 10^{-3}$ gauss)	I_0 (°)	MDF (Oe)	χ ($\times 10^{-3}$ gauss)	Q	T_c (°C)	Remarks
Hole 483 (cont.)								
22-1, 135	6b	28.5	−50	185	0.65	97.8	220	
22-2, 8	6b	35.2	−38	TD	0.88	88.9		
22-2, 77	6b	25.8	−49	339	0.35	163.0		
22-3, 34	6b	24.1	−45	TD	1.03	51.9		
22-3, 103	6b	22.5	−49	265	0.43	117.0	227	
Mean	6b	20.08	−46	148	1.42	49.0		Pillow basalt
22-4, 35	6c	24.5	−34	122	1.92	53.2		
22-4, 79	6c	47.6	−32	TD	1.46	72.2		
22-4, 103	6c	8.43	−35	93	2.13	8.8		
23-1, 64	6c	25.5	−36	78	1.50	37.9	162	
23-1, 113	6c	14.1	−42	90	2.02	15.5		
Mean	6c	24.0	−36	96	1.81	37.5		Massive basalt
23-2, 37	6d	10.3	−43	110	1.82	12.5		
23-2, 120	6d	19.9	−29	230	0.70	63.5		Pillow basalt
24-1, 48	7a	7.52	−31	76	2.28	7.3		
24-2, 4	7a	13.9	−32	85	2.87	10.7		
24-2, 61	7a	6.95	−28	80	3.52	4.4	132	
25-1, 24	7a	31.2	−28	92	1.97	35.3	205	
25-1, 84	7a	14.9	−33	83	3.09	10.7		
25-2, 74	7a	5.89	−31	67	3.15	4.1		
26-1, 11	7a	7.88	−32	74	2.99	5.9		
Mean	7a	12.61	−31	80	2.84	11.2		Massive basalt
26-1, 138	7b	5.22	−30	81	2.37	4.9		
26-2, 13	7b	6.55	−34	122	2.55	5.7		
26-2, 60	7b	28.5	−35	82	1.70	36.1		
26-3, 8	7b	16.2	−33	128	2.63	13.8	164	
26-3, 118	7b	6.34	−34	106	3.30	4.3		
Mean	7b	12.6	−33	104	2.51	13.0		Massive basalt
Mean	—	12.4	−36	102	1.89	25.0	—	
Hole 483B								
2-7, 91	1	8.14	27	75	2.76	6.5		
3-1, 46	1	7.28	29	77	2.82	5.7		Massive basalt
3-1, 121	2	6.05	−22	115	2.23	6.0	166	
4-1, 64	2	2.27	−16	82	2.31	2.2		
4-2, 83	2	2.13	−12	54	2.40	2.0		
4-3, 127	2	2.38	−16	64	2.20	2.4		
4-4, 11	2	1.31	−12	115	2.22	1.1	141	
4-5, 94	2	2.03	−19	100	2.14	2.1		
4-7, 4	2	2.64	−18	71	2.30	2.5		
Mean	2	2.69	−16	86	2.26	2.6		Massive basalt
7-1, 67	3	0.69	−46	100				
7-3, 49	3	1.60	−30	92				Massive basalt
8-1, 47	4	6.70	−40	95				
8-3, 15	4	0.73	−25?	54				Massive basalt
12-1, 98	5	8.48	−7	127				
13-1, 83	5	8.35	−32	105				
13-3, 35	5	11.18	−48	92				
14-1, 66	5	6.49	−49	75				
Mean	5	8.63	−34	100				Pillow basalt
17-1, 118	6a	6.91	−43	122				Massive basalt
18-1, 132	6b	5.27	−42	91				Massive basalt
19-1, 130	6c	6.63	−45	103				Massive basalt
19-3, 25	6d	15.20	−27	88				
20-1, 36	6d	1.56	−30	98				Massive basalt
21-1, 32	7b	10.83	−50	81				
21-2, 12	7b	6.97	−12	125				
21-2, 66	7b	11.69	−24	244				
21-2, 120	7b	6.57	−2	67				
22-2, 37	7b	6.54	−14	71				
22-2, 56	7b	5.23	−10	49				
23-1, 52	7b	10.39	−32	113				
23-3, 49	7b	6.23	−13	147				
24-1, 65	7b	10.11	−16	258				
Mean	7b	8.28	−19	128				Pillow basalt
25-2, 25	8b	3.72	−7	62				Massive basalt
27-1, 94	8c	5.01	−12	75				
27-4, 40	8c	2.25	−27	37				
28-1, 58	8c	3.54	−3	49				
29-1, 23	8c	5.31	−38	21				
Mean	8c	3.97	−17	49				Massive basalt
30-1, 106	9	5.38	−7	160				
32-1, 35	9	2.67	−15	100				Pillow basalt
Mean	—	5.70	−24	96				
Hole 485A								
11-3, 79	1	2.90	32	62	1.51	4.3		
12-1, 59	1	12.47	49	65	2.62	10.6	166	
13-1, 96	1	6.42	49	40	3.35	4.3		Massive basalt
14-1, 60	?	7.46	42	60	3.17	5.3		
17-1, 108	2	10.06	31	90	2.80	7.8	222	
17-2, 77	2	9.16	33	64	4.29	4.7		
18-1, 29	2	7.21	31	45	4.46	3.6		Massive basalt
23-1, 99	4	8.07	36	70	3.60	5.0		

Table 2. (Continued).

Core-Section (level in cm)	Lithologic Unit	NRM ($\times 10^{-3}$ gauss)	I_0 (°)	MDF (Oe)	χ ($\times 10^{-3}$ gauss)	Q	T_c (°C)	Remarks
Hole 485A (cont.)								
23-4, 12	4	6.6	32	43	2.49	4.2		
24-2, 21	4	5.08	55	62	2.97	3.8		
25-2, 29	4	6.92	46	55	4.0	3.8		
25-3, 29	4	7.15	44	70	3.42	4.6		Massive basalt
Mean	4	6.76	43	60	3.30	4.3		
29-1, 20	5	1.87	38	155				
29-3, 123	5	3.78	20	179	2.66	3.2	501	
29-4, 48	5	7.03	30	117	3.68	4.3		
30-1, 43	5	9.34	24	155	3.26	6.4	269/512	
30-3, 105	5	5.60	19	75	2.98	4.2		
31-2, 85	5	5.77	20	115	2.89	4.4		
32-1, 10	5	5.30	25	140	2.41	4.9	293/482	
32-3, 58	5	2.25	22	123	3.09	1.6		
32-5, 138	5	3.18	22	130	3.07	2.3		
32-6, 69	5	2.37	22	148	3.01	1.7		
33-2, 81	5	2.64	25	110	2.95	2.0		
Mean	5	4.47	24	131	3.00	3.5		Massive basalt
34-2, 68	6	6.79	39	34	3.49	4.3	182	
35-1, 26	6	6.40	38	45	3.98	3.6		
35-3, 72	6	6.29	38	55	3.77	3.7		
35-4, 47	6	5.38	39	45	3.38	3.5		
35-6, 44	6	5.68	38	40	3.21	4.1		
Mean	6	6.11	38	44	3.57	3.8		Massive basalt
38-2, 67	8	0.83	−55	135	2.20	0.8		
38-4, 102	8	1.16	−43	22	2.86	0.9		
38-6, 35	8	2.31	?	35	3.22	1.6	253	
39-2, 77	8	2.78	?	28	3.13	2.0		
39-4, 27	8	2.98	?	40				
39-5, 8	8	1.14	?	20	2.71	0.9	273	
Mean	8	1.87	—	47	2.82	1.2		Massive basalt
Mean	—	5.31	34	79	3.14	3.8	—	

Note: NRM = natural remanent magnetization; I_0 = stable inclination; MDF = median destructive field; χ = susceptibility; Q = Koenigsberger ratio; T_c = Curie temperature; TD = thermal demagnetization; * = not reliable.

The MDFs are very high for material that is so coarse-grained.

The paleomagnetic properties of Unit 8 are characteristic of a body that has cooled slowly. The stable inclination in four of the six samples could not be determined, although it is obvious that this unit is reversely magnetized.

The mean inclination in the basalts at the site (34°) is shallower than the axial dipole inclination (39°).

SUMMARY

The paleomagnetic results from DSDP Leg 65 are typical of Pacific oceanic basalts. The average NRM intensity is high and the MDF low, although the directional stability is good after an intense soft component has been removed. The stable inclinations at each site group around the axial dipole inclination.

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