

Table 1

Compressional (P) and shear (S) wave velocities (km s^{-1})

Compressional and shear wave velocities

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Identification number	Bulk density	Mode	$P = 0.2 \text{ kb}$	$P = 0.4 \text{ kb}$	$P = 0.6 \text{ kb}$	$P = 0.8 \text{ kb}$	$P = 1.0 \text{ kb}$	$P = 2.0 \text{ kb}$	$P = 4.0 \text{ kb}$	$P = 6.0 \text{ kb}$	$P = 8.0 \text{ kb}$	$P = 10.0 \text{ kb}$
EPR 1-1	2.943	P	6.42	6.44	6.47	6.49	6.505	6.587	6.680	6.716	6.742	6.754
EPR 1-2	2.958	P	6.31	6.35	6.39	6.42	6.450	6.564	6.686	6.742	6.776	6.791
EPR 1-3	2.957	P	6.30	6.33	6.36	6.39	6.426	6.520	6.625	6.670	6.696	6.716
Mean	2.953	P	6.34	6.37	6.41	6.43	6.460	6.557	6.664	6.709	6.738	6.754
EPR 1-1	2.943	S	3.41	3.44	3.48	3.50	3.525	3.605	3.681	3.705	3.714	3.722
EPR 1-2	2.958	S	3.40	3.42	3.45	3.47	3.485	3.568	3.662	3.695	3.708	3.714
EPR 1-3	2.957	S	3.33	3.38	3.41	3.44	3.460	3.550	3.639	3.668	3.676	3.684
Mean	2.953	S	3.38	3.41	3.45	3.47	3.490	3.574	3.661	3.689	3.699	3.707
EPR 2-1	2.937	P	6.24	6.31	6.36	6.41	6.447	6.574	6.691	6.738	6.758	6.767
EPR 2-2	2.944	P	6.25	6.31	6.36	6.41	6.445	6.574	6.682	6.727	6.752	6.763
EPR 2-3	2.953	P	6.29	6.37	6.43	6.47	6.515	6.596	6.708	6.800	6.820	6.831
Mean	2.945	P	6.26	6.33	6.38	6.43	6.469	6.596	6.708	6.755	6.777	6.787
EPR 2-1	2.937	S	3.25	3.31	3.37	3.43	3.470	3.592	3.681	3.706	3.715	3.721
EPR 2-2	2.944	S	3.25	3.33	3.38	3.44	3.481	3.602	3.693	3.710	3.720	3.729
EPR 2-3	2.953	S	3.24	3.33	3.42	3.48	3.525	3.645	3.724	3.738	3.750	3.757
Mean	2.945	S	3.25	3.32	3.39	3.45	3.492	3.613	3.699	3.718	3.728	3.736
EPR 3-1	2.868	P	6.26	6.34	6.39	6.44	6.476	6.600	6.707	6.747	6.760	6.765
EPR 3-2	2.865	P	6.15	6.21	6.25	6.29	6.325	6.455	6.595	6.665	6.695	6.702
EPR 3-3	2.881	P	6.25	6.33	6.38	6.43	6.464	6.585	6.694	6.741	6.757	6.764
Mean	2.871	P	6.22	6.29	6.34	6.39	6.422	6.547	6.665	6.718	6.737	6.744
EPR 3-1	2.868	S	3.20	3.36	3.43	3.46	3.494	3.590	3.660	3.674	3.685	3.695
EPR 3-2	2.865	S	3.10	3.22	3.33	3.40	3.401	3.580	3.667	3.682	3.698	3.706
EPR 3-3	2.881	S	3.15	3.25	3.40	3.45	3.491	3.608	3.696	3.714	3.732	3.741
Mean	2.871	S	3.15	3.28	3.39	3.44	3.462	3.593	3.674	3.690	3.705	3.714
EPR 4-1	2.872	P	5.95	6.03	6.10	6.17	6.235	6.432	6.580	6.643	6.665	6.674
EPR 4-2	2.876	P	5.85	5.98	6.10	6.18	6.250	6.465	6.626	6.692	6.722	6.734
EPR 4-3	2.883	P	6.04	6.11	6.17	6.21	6.256	6.465	6.626	6.692	6.722	6.734
Mean	2.877	P	5.95	6.04	6.12	6.21	6.256	6.465	6.626	6.692	6.722	6.734
EPR 4-1	2.872	S	3.00	3.12	3.19	3.26	3.320	3.500	3.611	3.651	3.683	3.694
EPR 4-2	2.876	S	2.89	2.98	3.14	3.26	3.320	3.516	3.649	3.682	3.695	3.661
EPR 4-3	2.883	S	3.18	3.26	3.30	3.35	3.381	3.490	3.590	3.623	3.640	3.649
Mean	2.877	S	3.02	3.12	3.21	3.29	3.340	3.502	3.617	3.650	3.663	3.672
EPR 5-1	2.829	P	5.94	5.96	5.98	6.01	6.023	6.095	6.182	6.235	6.264	6.282
EPR 5-2	2.830	P	5.85	5.88	5.91	5.93	5.948	6.095	6.182	6.235	6.264	6.282
EPR 5-3	2.810	P	5.69	5.73	5.76	5.78	5.805	5.900	6.015	6.108	6.205	6.125
Mean	2.823	P	5.83	5.86	5.88	5.91	5.925	6.006	6.095	6.163	6.192	6.211
EPR 5-1	2.829	S	3.17	3.21	3.24	3.27	3.291	3.368	3.432	3.458	3.470	3.480
EPR 5-2	2.830	S	3.14	3.12	3.20	3.22	3.240	3.315	3.388	3.414	3.423	3.430
EPR 5-3	2.810	S	3.00	3.04	3.07	3.09	3.111	3.200	3.291	3.323	3.337	3.346
Mean	2.823	S	3.10	3.12	3.17	3.19	3.214	3.294	3.370	3.398	3.410	3.419

Table 2

Elastic constants calculated from V_p , V_s , and ρ

Identification number	Pressure, kb	V_p/V_s	σ	ϕ , $(\text{km s}^{-1})^2$	K , Mb	β , Mb^{-1}	μ , Mb	E , Mb	λ , Mb
EPR 1	0.4	1.87	0.30	25.1	0.74	1.35	0.34	0.89	0.51
	1.0	1.85	0.29	25.5	0.75	1.34	0.36	0.93	0.52
	2.0	1.83	0.29	25.9	0.78	1.30	0.38	0.97	0.52
	6.0	1.82	0.28	26.7	0.80	1.26	0.40	1.03	0.53
	10.0	1.82	0.28	27.1	0.81	1.24	0.41	1.05	0.54
EPR 2	0.4	1.91	0.31	25.4	0.75	1.34	0.32	0.85	0.53
	1.0	1.85	0.29	25.6	0.75	1.33	0.36	0.93	0.51
	2.0	1.83	0.29	26.1	0.77	1.30	0.38	0.99	0.51
	6.0	1.82	0.28	27.1	0.80	1.25	0.41	1.05	0.53
	10.0	1.82	0.28	27.2	0.81	1.23	0.41	1.06	0.54
EPR 3	0.4	1.91	0.31	25.2	0.73	1.38	0.31	0.81	0.52
	1.0	1.85	0.30	25.2	0.73	1.38	0.34	0.89	0.50
	2.0	1.82	0.28	25.6	0.74	1.36	0.37	0.95	0.49
	6.0	1.82	0.28	26.8	0.78	1.29	0.39	1.01	0.52
	10.0	1.82	0.28	26.9	0.78	1.28	0.40	1.02	0.52
EPR 4	0.4	1.94	0.32	23.5	0.68	1.48	0.28	0.74	0.49
	1.0	1.87	0.30	24.1	0.70	1.44	0.32	0.83	0.48
	2.0	1.84	0.29	25.0	0.72	1.39	0.35	0.91	0.49
	6.0	1.82	0.28	26.3	0.76	1.31	0.38	0.99	0.51
	10.0	1.82	0.28	26.6	0.78	1.29	0.39	1.00	0.52
EPR 5	0.4	1.88	0.30	21.4	0.60	1.66	0.27	0.75	0.42
	1.0	1.84	0.29	21.3	0.60	1.66	0.29	0.75	0.41
	2.0	1.82	0.28	21.6	0.61	1.64	0.31	0.79	0.41
	6.0	1.82	0.28	22.5	0.64	1.56	0.32	0.84	0.42
	10.0	1.82	0.28	22.8	0.65	1.53	0.33	0.85	0.43

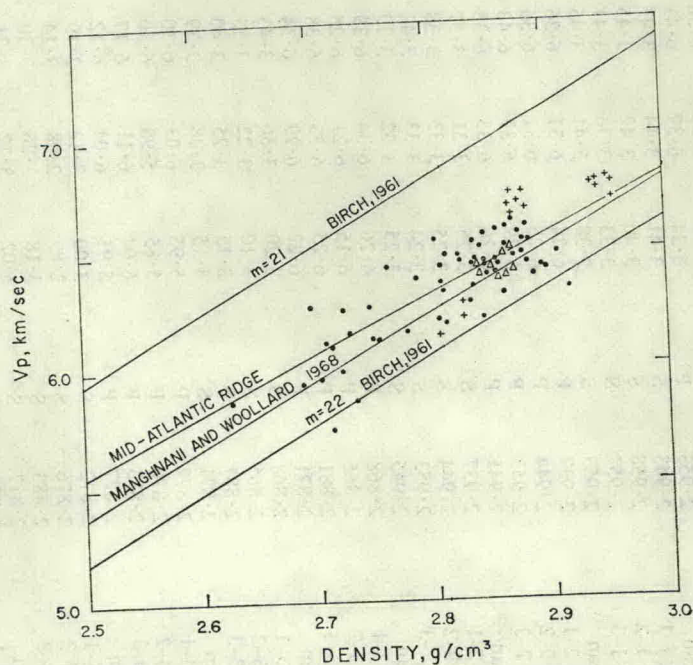


FIG. 1. Compressional wave velocities at 10kb as a function of bulk densities for basaltic rocks from the Mid-Atlantic Ridge ($\cdot$), the Juan de Fuca Ridge (Δ), and the East Pacific Rise ($+$).