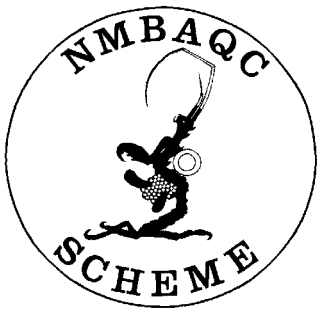

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Analytical Quality Control Scheme
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Particle Size Results – PS39

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Table 1. Summary of the particle size information received from participating laboratories and replicate analysis laboratory for the thirty-ninth particle size distribution - PS39.

Benchmark Data

Sample	Method	%<63µm	Median	Mean	Sort	IGS (Ski)
PS38 60	WS/DS/L[1]	35.56	2.61	3.01	3.89	0.06
PS38 61	WS/DS/L[1]	34.21	2.54	2.95	3.86	0.06
PS38 62	WS/DS/L[1]	37.00	2.67	3.02	3.88	0.04
PS38 63	WS/DS/L[1]	36.56	2.71	3.05	3.89	0.04
PS38 64	WS/DS/L[1]	36.87	2.62	3.03	3.93	0.06
PS38 65	WS/DS/L[1]	35.40	2.62	3.00	3.88	0.05
PS38 66	WS/DS/L[1]	36.25	2.68	3.03	3.90	0.04
PS38 67	WS/DS/L[1]	34.84	2.60	2.98	3.85	0.06
PS38 68	WS/DS/L[1]	34.40	2.52	2.95	3.87	0.07
PS38 69	WS/DS/L[1]	35.24	2.67	3.00	3.87	0.04
UM	WS/DS/L[1]	**35.63**	**2.63**	**3.00**	**3.88**	**0.05**

Participant Data

Lab	Method	%<63µm	Median	Mean	Sort	IGS (Ski)
LB1701	L	35.90	2.79	3.04	3.19	0.15
LB1702	DS/L	13.20	-	-	-	-
LB1705	L	26.95	-	-	-	-
LB1707	WS/DS/L	30.74	2.64	2.92	3.79	0.03
LB1712	DS/L	33.10	-	-	-	-
LB1713	DS/L	50.01	-	-	-	-
LB1715	CL	32.90	4.00	3.72	3.37	-0.08
LB1716	L	52.06	-	-	-	-
LB1726	L	32.00	-	-	-	-

Key to methods:
L[1] - Replicate analysis by Malvern MS2000+Hydro-G 0.02-2000µm; no blue laser
L - Laser analysis
S - Sieve
WS - Wet Sieve
DS - Dry Sieve
CL - Coulter laser
"-" - No data provided

Table 2. Summary of z-scores for each phi interval for PS39.

	phi interval																		
	-6.50 to -6.00	-6.00 to -5.50	-5.50 to -5.00	-5.00 to -4.50	-4.50 to -4.00	-4.00 to -3.50	-3.50 to -3.00	-3.00 to -2.50	-2.50 to -2.00	-2.00 to -1.50	-1.50 to -1.00	-1.00 to -0.50	-0.50 to 0.00	0.00 to 0.50	0.50 to 1.00	1.00 to 1.50	1.50 to 2.00	2.00 to 2.50	2.50 to 3.00	3.00 to 3.50
LB1701	0.00	0.00	0.00	0.00	-1.37	0.00	-0.32	0.00	2.37	0.57	0.25	0.03	0.55	-0.45	0.07	0.98	0.46	0.04	-0.12	-0.39
LB1702	0.00	0.00	0.00	0.00	0.85	0.00	-0.32	0.00	0.01	0.61	0.61	0.00	0.79	-0.47	-0.19	1.29	1.78	1.97	1.92	1.52
LB1705	0.00	0.00	0.00	0.00	-1.37	0.00	2.85	0.00	1.24	1.08	0.83	0.26	1.21	-0.61	-0.59	-0.59	-0.23	-0.53	-0.71	-0.76
LB1707	0.00	0.00	0.00	0.00	0.77	0.00	-0.32	0.00	-0.52	0.97	0.31	0.07	0.47	1.87	-0.35	-1.86	-1.62	-1.28	0.50	0.13
LB1712	0.00	0.00	0.00	0.00	0.31	0.00	-0.32	0.00	-0.52	-1.09	-0.46	-1.29	-0.34	-0.07	0.47	0.10	0.11	0.18	0.10	0.61
LB1713	0.00	0.00	0.00	0.00	-0.14	0.00	-0.32	0.00	-0.52	-0.10	-0.49	-0.53	-0.76	-0.34	-0.43	-0.79	-0.38	-0.42	-0.61	0.09
LB1715	0.00	0.00	0.00	0.00	-1.37	0.00	-0.32	0.00	-0.52	-1.09	-1.53	2.27	-0.46	1.87	2.67	0.59	-1.13	-0.89	-1.15	-1.69
LB1716	0.00	0.00	0.00	0.00	0.50	0.00	-0.32	0.00	-0.52	-1.09	-1.53	-1.29	-2.27	-0.61	-0.59	1.11	1.22	1.43	1.39	1.47
LB1726	0.00	0.00	0.00	0.00	0.88	0.00	-0.32	0.00	-0.52	-1.09	1.56	0.37	0.32	-0.61	-0.61	-0.52	-0.08	-0.16	-0.49	-0.28
BENCHMARK	0.00	0.00	0.00	0.00	0.94	0.00	-0.32	0.00	-0.52	1.21	0.44	0.10	0.48	-0.59	-0.46	-0.28	-0.12	-0.35	-0.84	-0.69

	Phi interval																		
	3.50 to 4.00	4.00 to 4.50	4.50 to 5.00	5.00 to 5.50	5.50 to 6.00	6.00 to 6.50	6.50 to 7.00	7.00 to 7.50	7.50 to 8.00	8.00 to 8.50	8.50 to 9.00	9.00 to 9.50	9.50 to 10.00	10.00 to 10.50	10.50 to 11.00	11.00 to 11.50	11.50 to 12.00	12.00 to 12.50	12.50 to 13.00	13.00 to 13.50
LB1701	-0.36	0.19	0.21	0.31	0.16	0.10	0.16	0.18	0.14	-0.14	0.12	-0.25	-0.65	-0.86	-0.77	-0.65	-0.32	0.00	0.00	0.00
LB1702	0.02	-1.04	-1.73	-1.82	-2.11	-2.15	-1.97	-2.01	-1.99	-1.91	-1.29	-1.29	-0.75	-0.30	-0.24	-0.37	-0.32	0.00	0.00	0.00
LB1705	-0.82	-0.36	-0.39	-0.13	-0.48	-0.59	-0.49	-0.63	-0.55	1.62	-1.92	-1.98	-1.42	-0.92	-0.77	-0.65	-0.32	0.00	0.00	0.00
LB1707	0.55	-1.83	-1.12	-0.44	-0.10	0.02	-0.06	-0.37	-0.49	-0.53	0.31	0.80	0.83	0.03	-0.65	-0.65	-0.32	0.00	0.00	0.00
LB1712	1.11	1.02	0.92	0.95	0.98	1.03	1.13	1.09	1.06	0.65	0.86	0.28	-1.00	-0.92	-0.77	-0.65	-0.32	0.00	0.00	0.00
LB1713	1.06	1.48	1.53	1.45	1.33	1.27	1.34	1.34	1.37	0.87	1.03	0.48	-0.35	-0.84	-0.77	-0.65	-0.32	0.00	0.00	0.00
LB1715	-1.19	0.03	0.16	-0.88	-0.01	0.17	-0.68	-0.11	-0.13	-0.38	-0.36	0.30	0.44	0.03	0.12	-0.14	-0.32	0.00	0.00	0.00
LB1716	1.50	1.03	1.06	1.18	1.08	0.96	1.02	1.01	1.05	0.74	1.25	1.51	1.85	2.06	2.13	2.22	-0.32	0.00	0.00	0.00
LB1726	-0.69	-0.23	-0.40	-0.44	-0.61	-0.63	-0.52	-0.59	-0.57	-0.69	-0.13	0.05	0.62	0.99	1.07	1.33	2.85	0.00	0.00	0.00
BENCHMARK	-1.18	-0.30	-0.24	-0.16	-0.24	-0.16	0.06	0.10	0.11	-0.23	0.14	0.10	0.44	0.74	0.67	0.22	-0.32	0.00	0.00	0.00

* Intervals left blank or marked '-' (not analysed) have been entered as 0 to calculate z-scores.

Figure 1. Particle size distribution curves resulting from analysis of ten replicate samples of sediment distributed as PS39 (Benchmark Data).

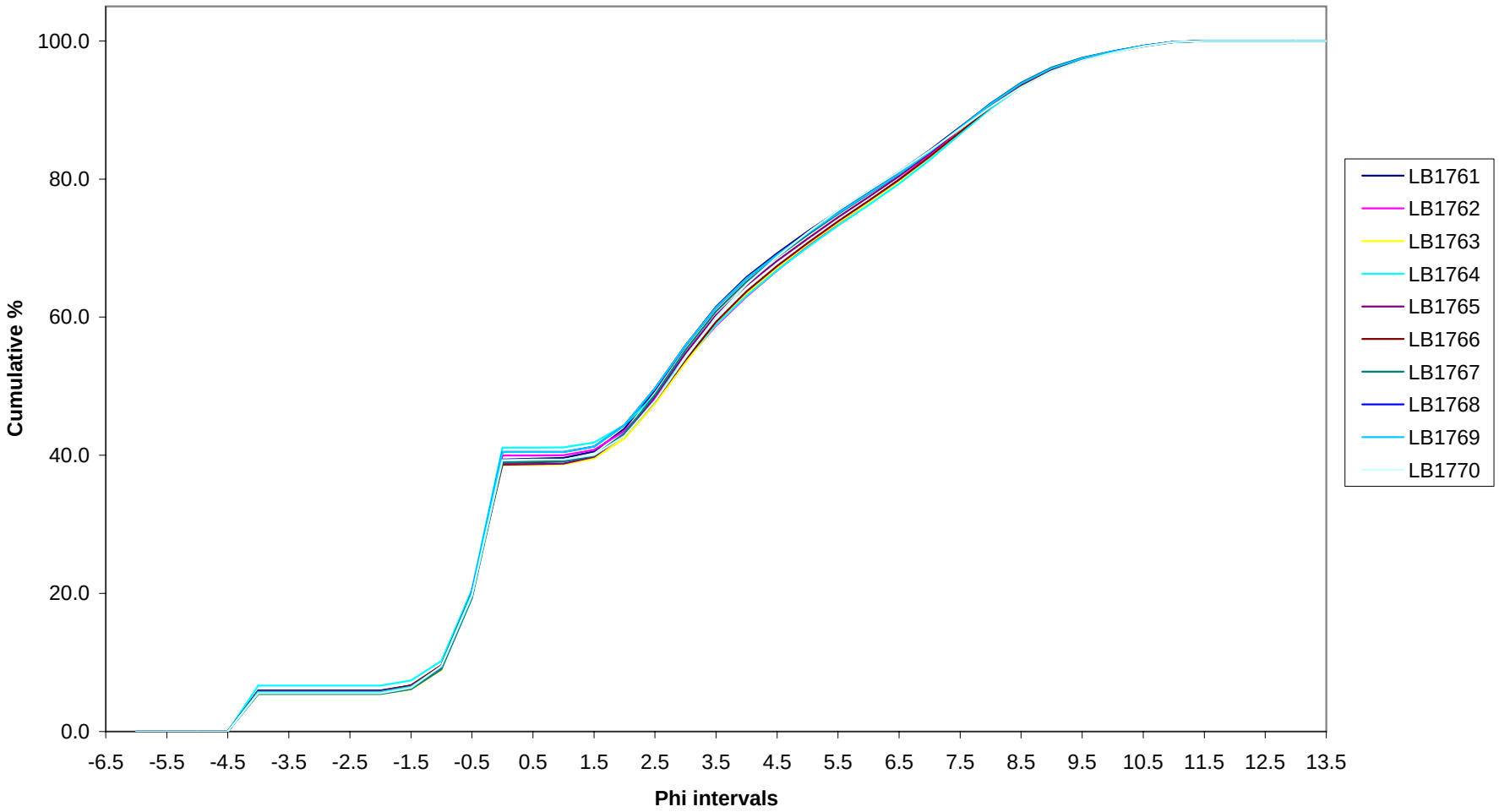
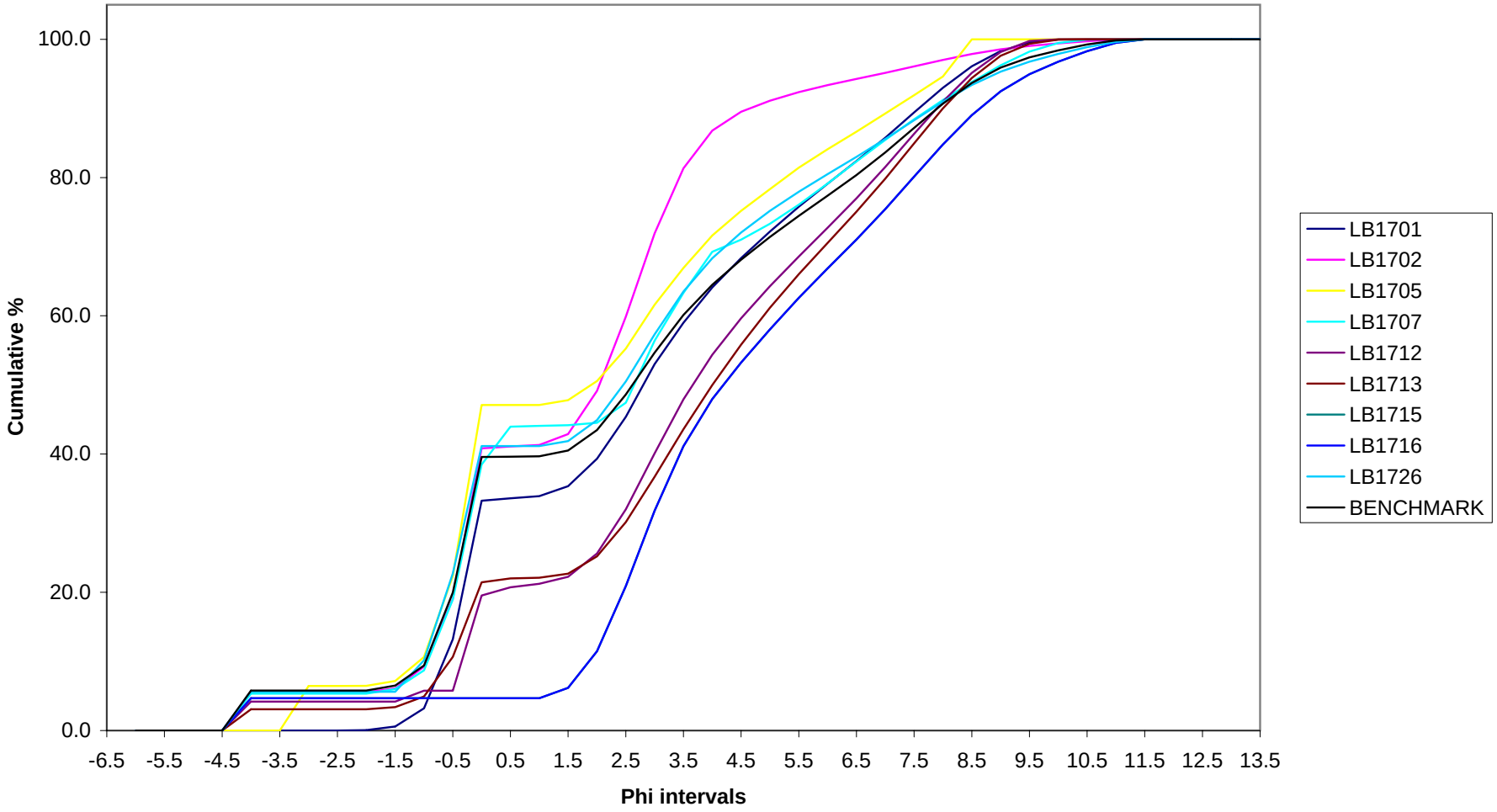


Figure 2. Particle size distribution curves from all participating laboratories for sediment samples from PS39.



Results of SIMPROF testing on PSA Ring test PS39 data

Sediment fractions were first reduced to lowest common denominators to allow full comparison between test labs:

- All fractions between -4.0φ and -1.0φ were combined into 1φ intervals rather than 0.5φ intervals.

The data was then entered into PRIMER v.6.1.13 and used to create a Manhattan distance matrix. From this distance matrix cluster analysis was carried out, including a SIMPROF test at a 5% significance level. These results are presented as cluster dendrograms below:

Figure 3. Replicates from the control lab kept separate.

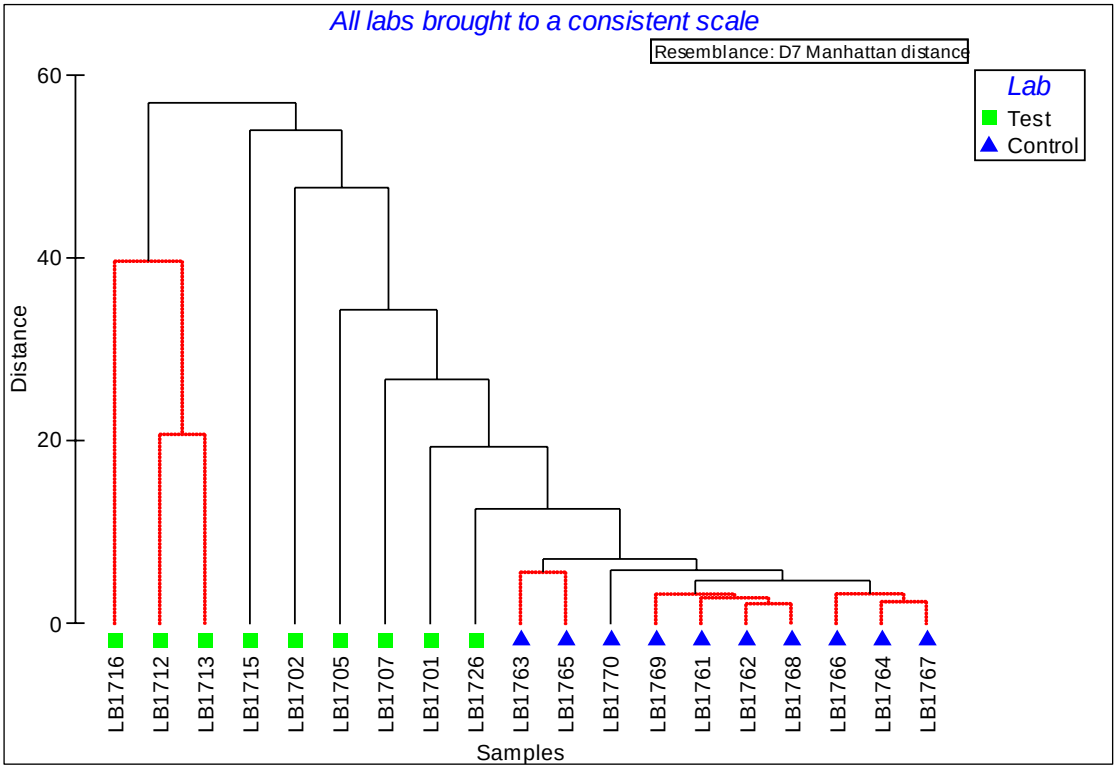


Figure 4. Replicates from control data averaged.

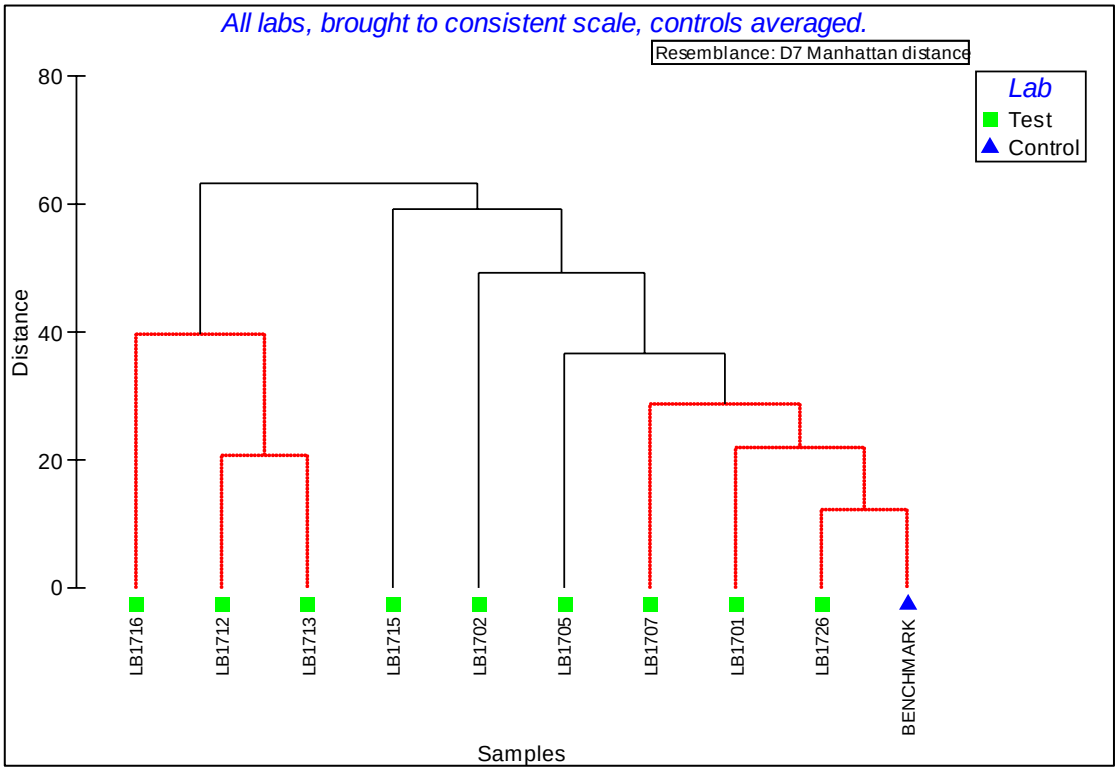
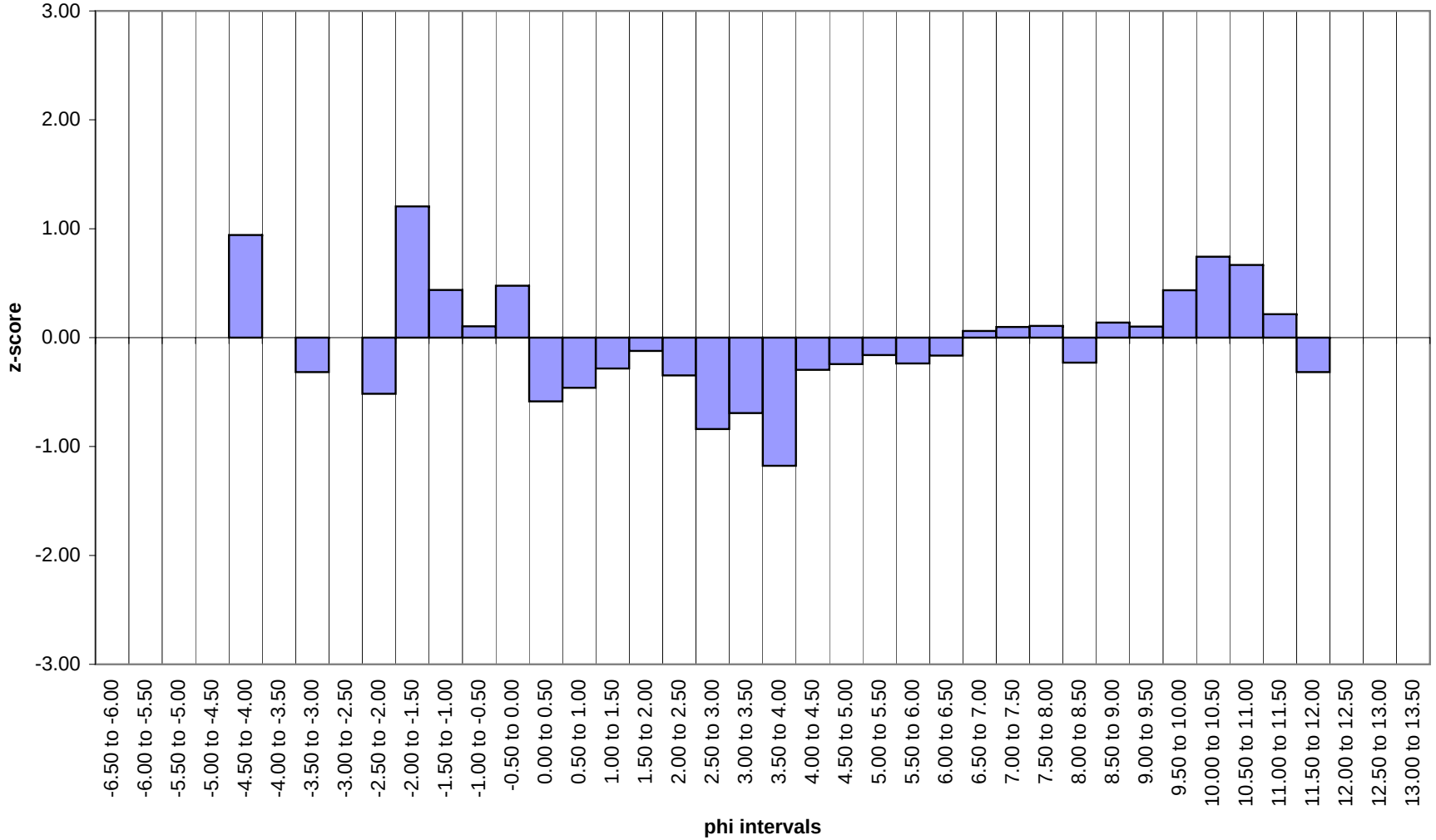
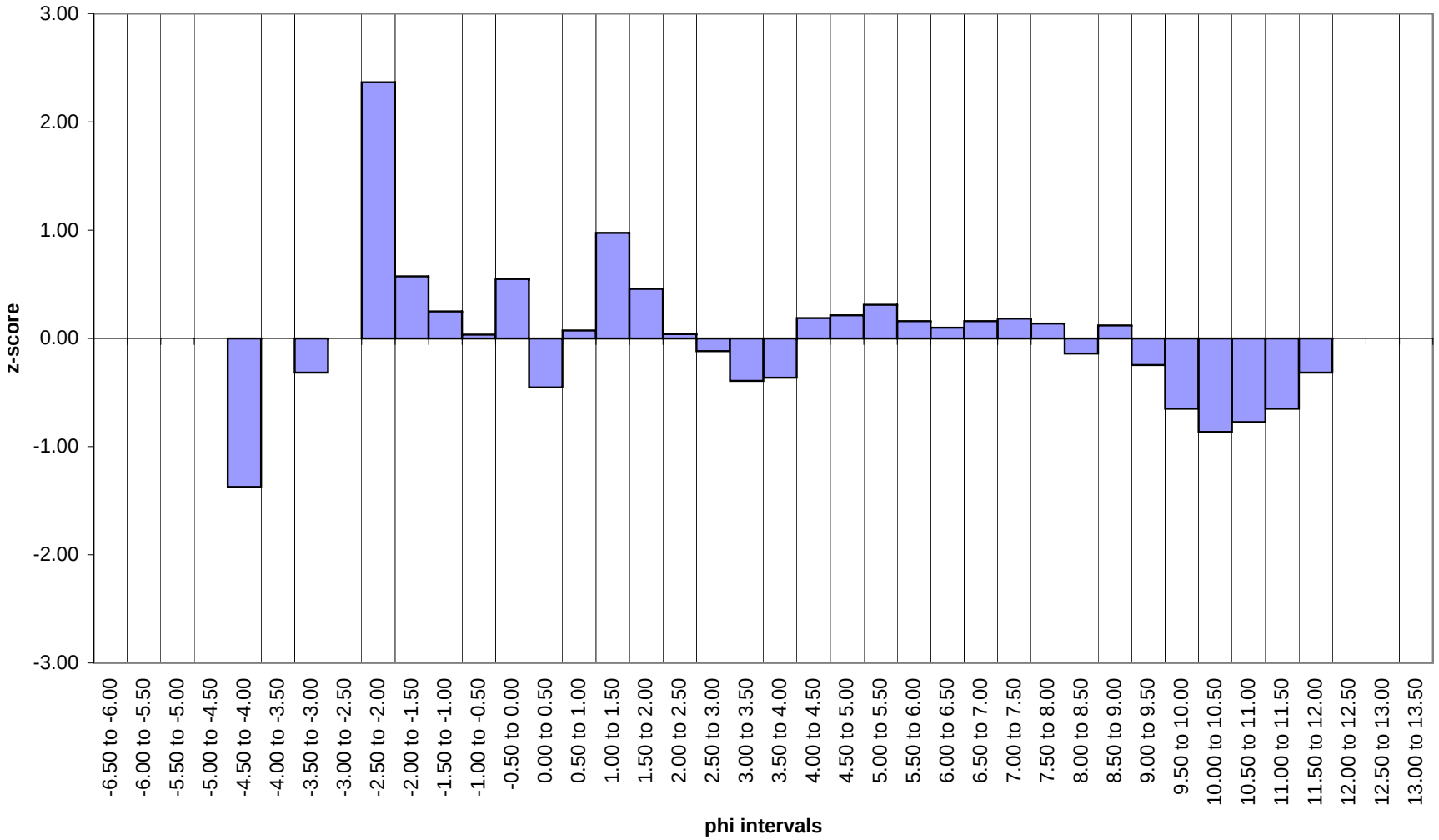


Figure 5. z-scores for each phi interval for the benchmark data for the sediment PS39.

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1.00
0.00
-1.00
-2.00
-3.00
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-6.00 to -5.50
-5.50 to -5.00
-5.00 to -4.50
-4.50 to -4.00
-4.00 to -3.50
-3.50 to -3.00
-3.00 to -2.50
-2.50 to -2.00
-2.00 to -1.50
-1.50 to -1.00
-1.00 to -0.50
-0.50 to 0.00
0.00 to 0.50
0.50 to 1.00
1.00 to 1.50
1.50 to 2.00
2.00 to 2.50
2.50 to 3.00
3.00 to 3.50
3.50 to 4.00
4.00 to 4.50
4.50 to 5.00
5.00 to 5.50
5.50 to 6.00
6.00 to 6.50
6.50 to 7.00
7.00 to 7.50
7.50 to 8.00
8.00 to 8.50
8.50 to 9.00
9.00 to 9.50
9.50 to 10.00
10.00 to 10.50
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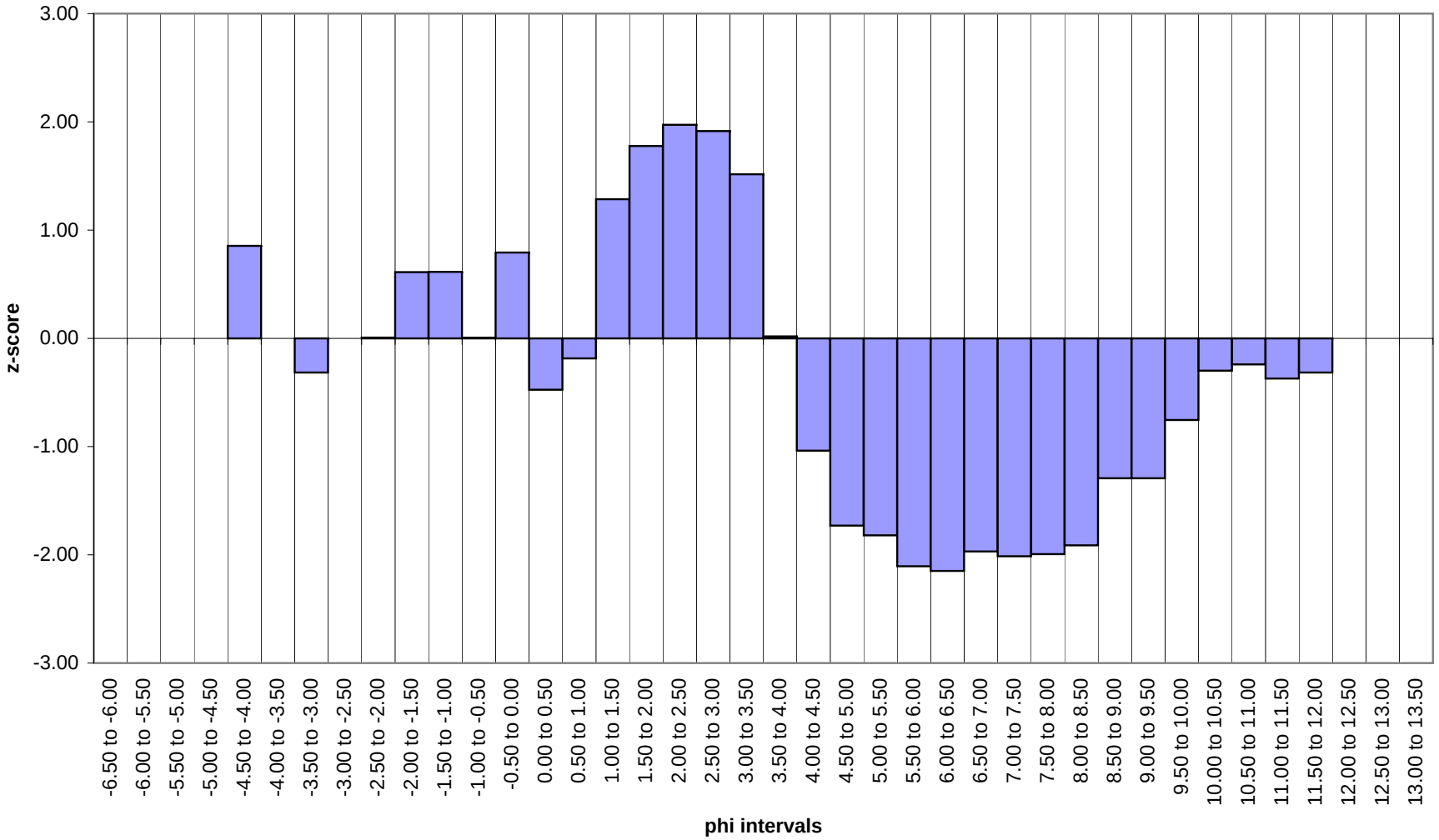
11.50 to 12.00
12.00 to 12.50
12.50 to 13.00
13.00 to 13.50
phi intervals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-5.50 to -5.00
-5.00 to -4.50
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-4.00 to -3.50
-3.50 to -3.00
-3.00 to -2.50
-2.50 to -2.00
-2.00 to -1.50
-1.50 to -1.00
-1.00 to -0.50
-0.50 to 0.00
0.00 to 0.50
0.50 to 1.00
1.00 to 1.50
1.50 to 2.00
2.00 to 2.50
2.50 to 3.00
3.00 to 3.50
3.50 to 4.00
4.00 to 4.50
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5.00 to 5.50
5.50 to 6.00
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9.50 to 10.00
10.00 to 10.50
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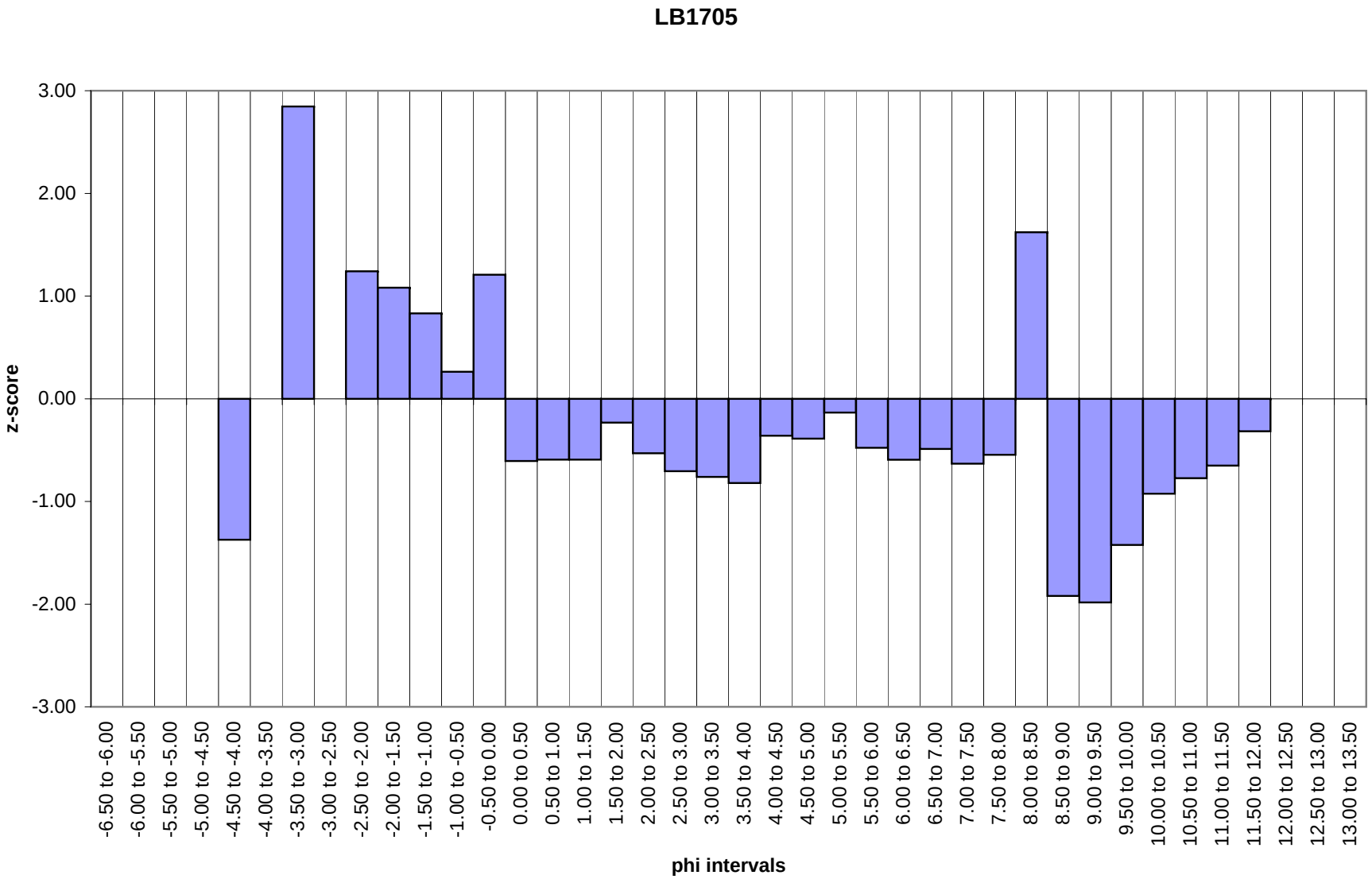
11.50 to 12.00
12.00 to 12.50
12.50 to 13.00
13.00 to 13.50
phi intervals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0.00
-1.00
-2.00
-3.00
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-6.00 to -5.50
-5.50 to -5.00
-5.00 to -4.50
-4.50 to -4.00
-4.00 to -3.50
-3.50 to -3.00
-3.00 to -2.50
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-2.00 to -1.50
-1.50 to -1.00
-1.00 to -0.50
-0.50 to 0.00
0.00 to 0.50
0.50 to 1.00
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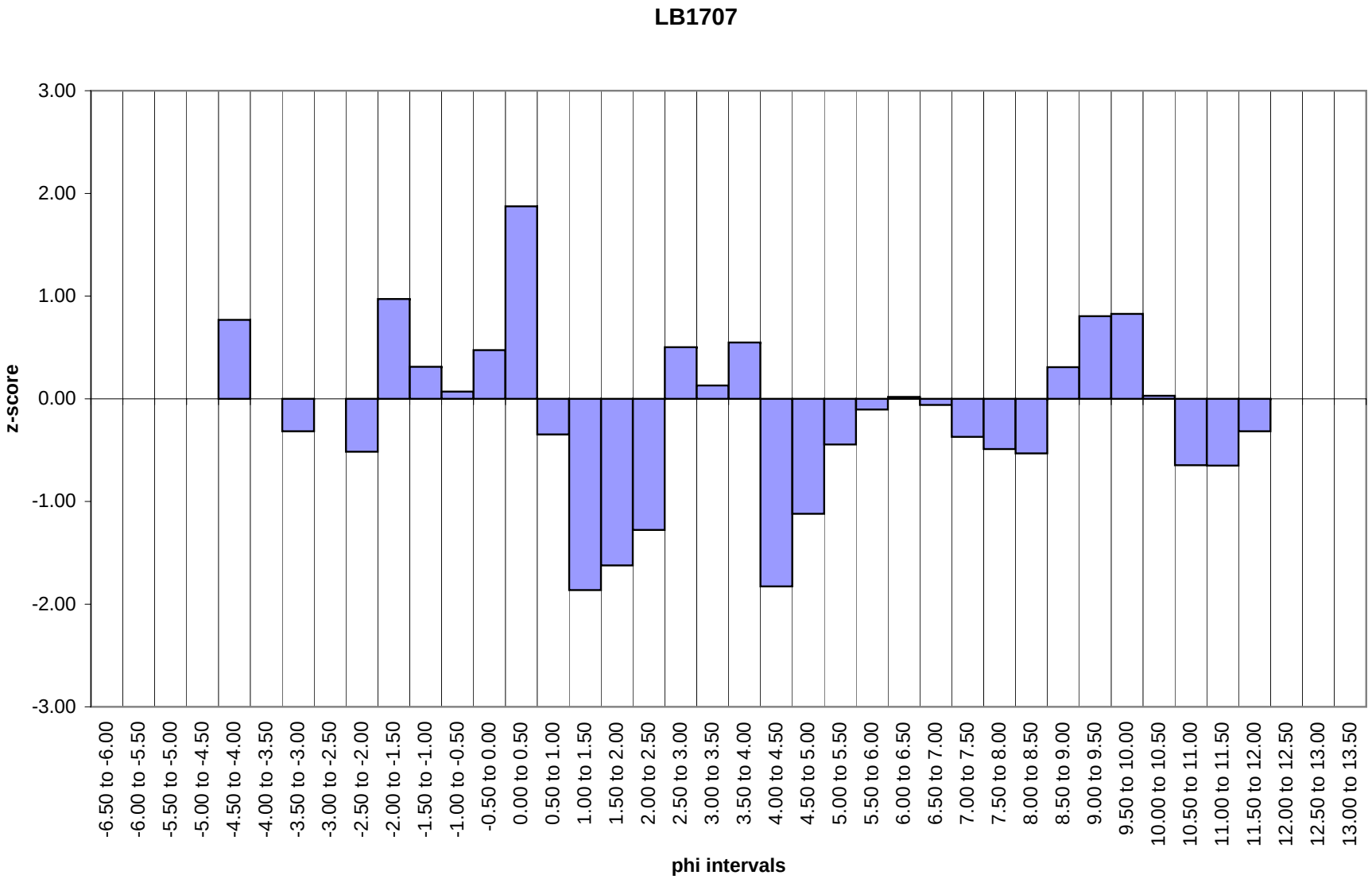
13.00 to 13.50
phi intervals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-5.50 to -5.00
-5.00 to -4.50
-4.50 to -4.00
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-3.50 to -3.00
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10.00 to 10.50
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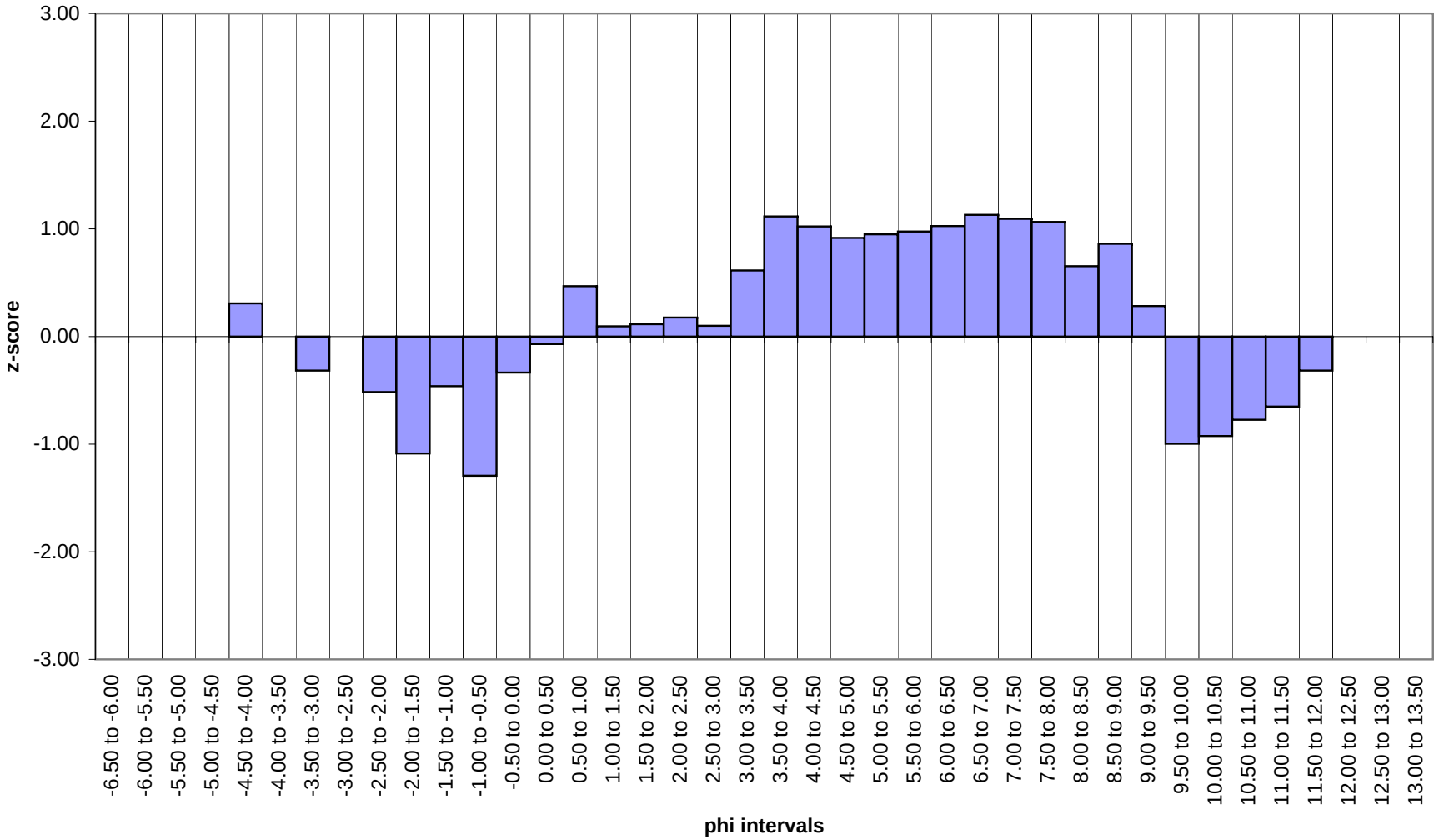
12.50 to 13.00
13.00 to 13.50
phi intervals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-5.50 to -5.00
-5.00 to -4.50
-4.50 to -4.00
-4.00 to -3.50
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-3.00 to -2.50
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-2.00 to -1.50
-1.50 to -1.00
-1.00 to -0.50
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0.00 to 0.50
0.50 to 1.00
1.00 to 1.50
1.50 to 2.00
2.00 to 2.50
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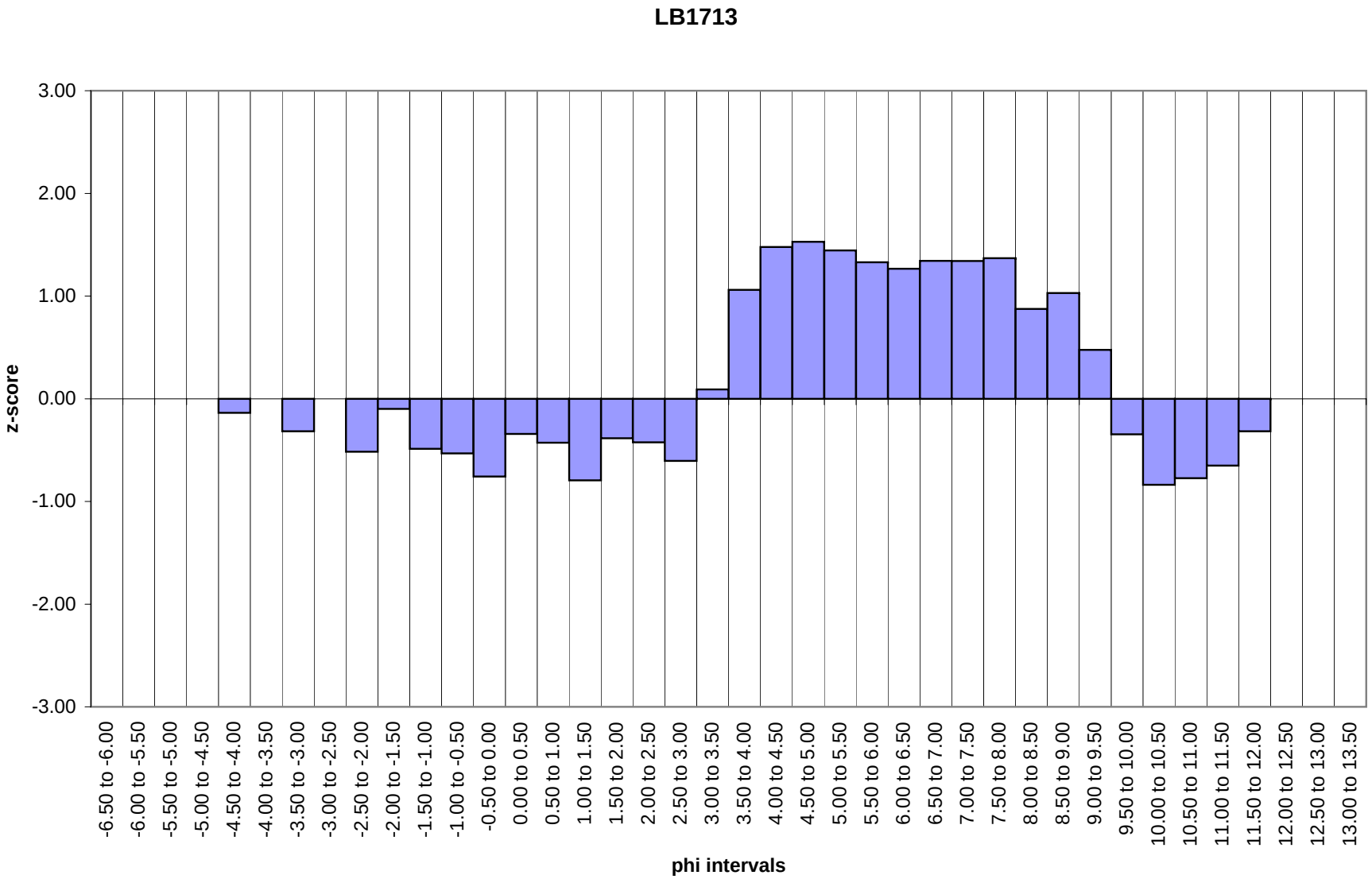
12.50 to 13.00
13.00 to 13.50
phi intervals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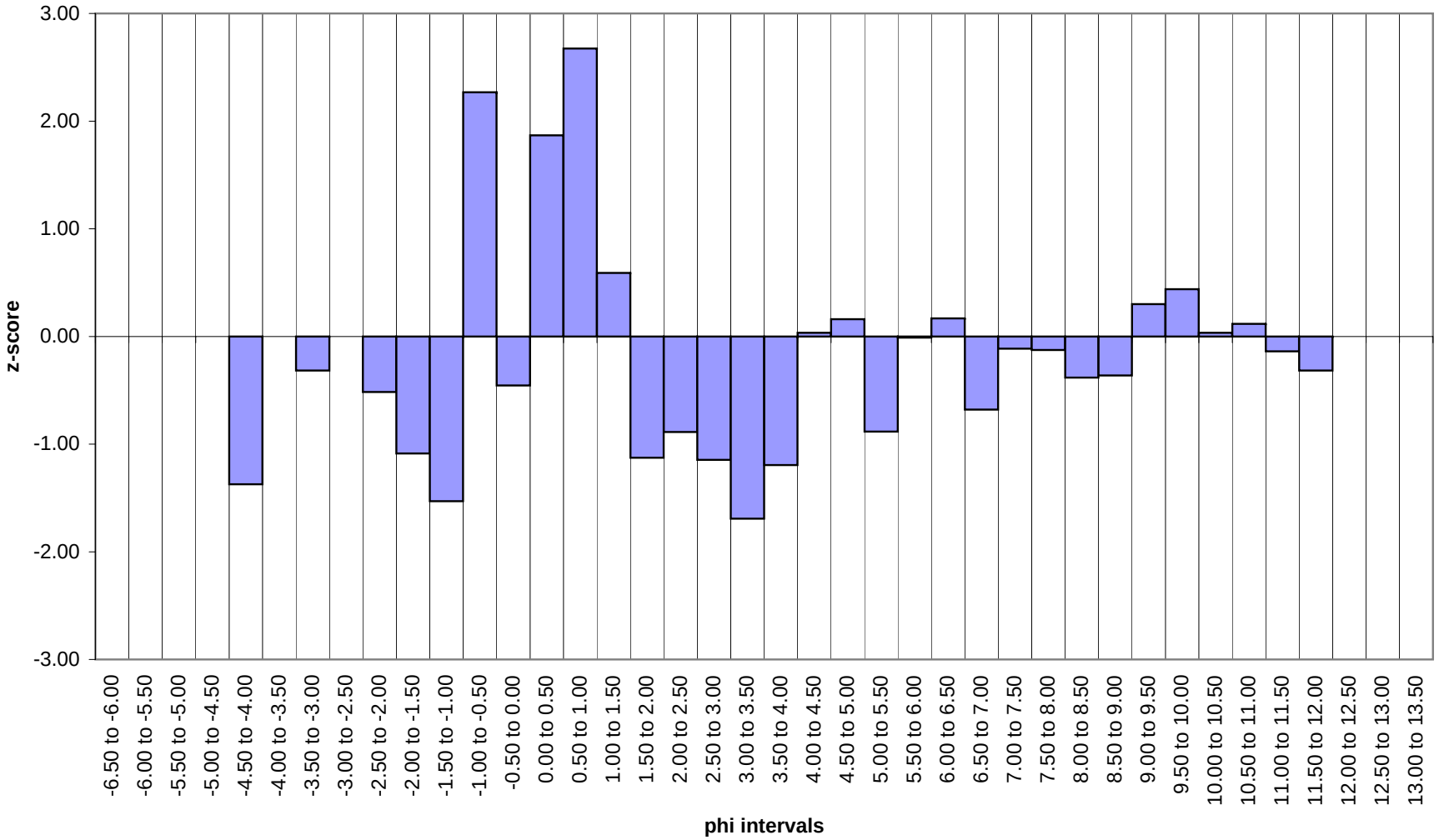
13.00 to 13.50
phi intervals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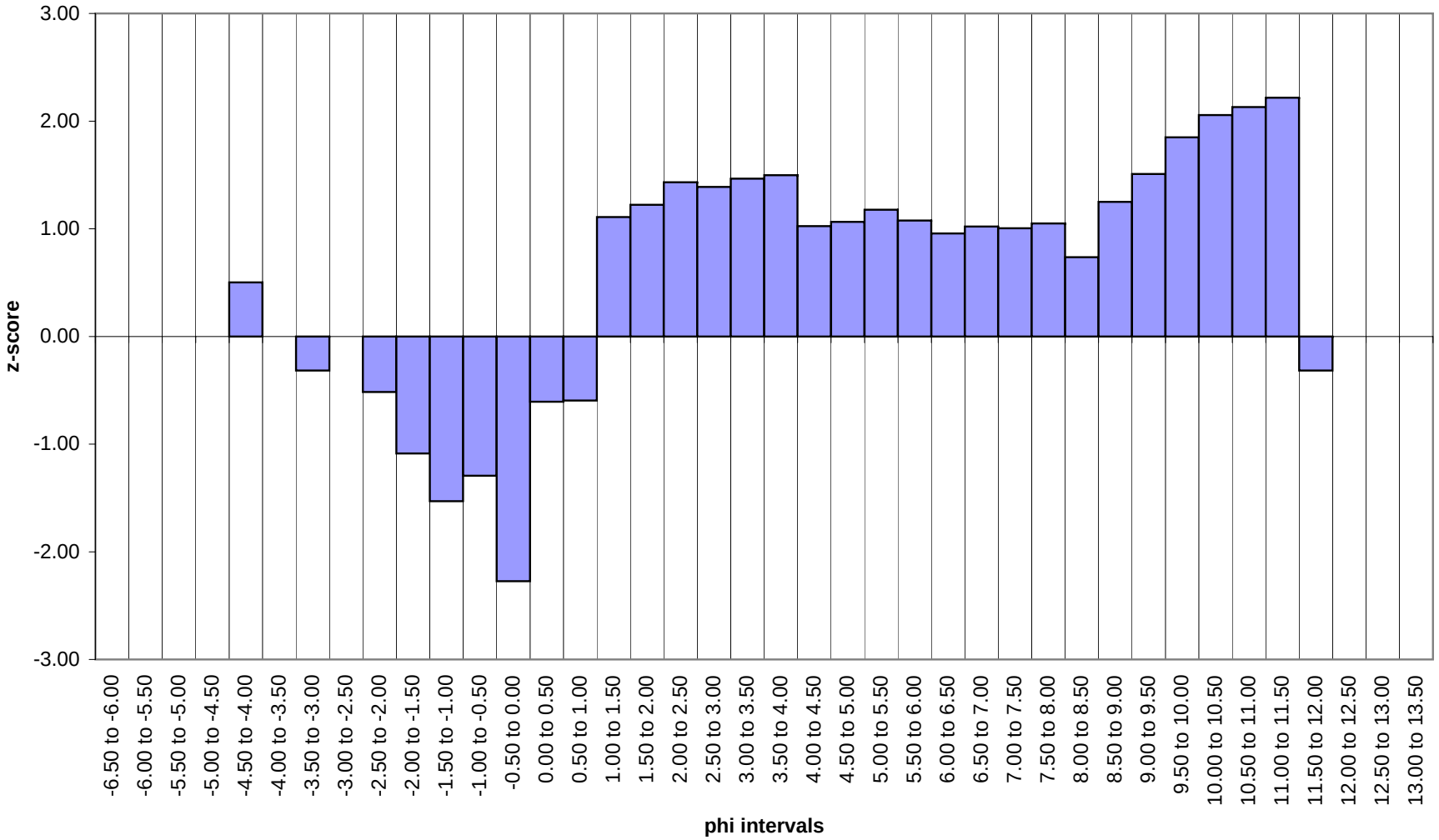
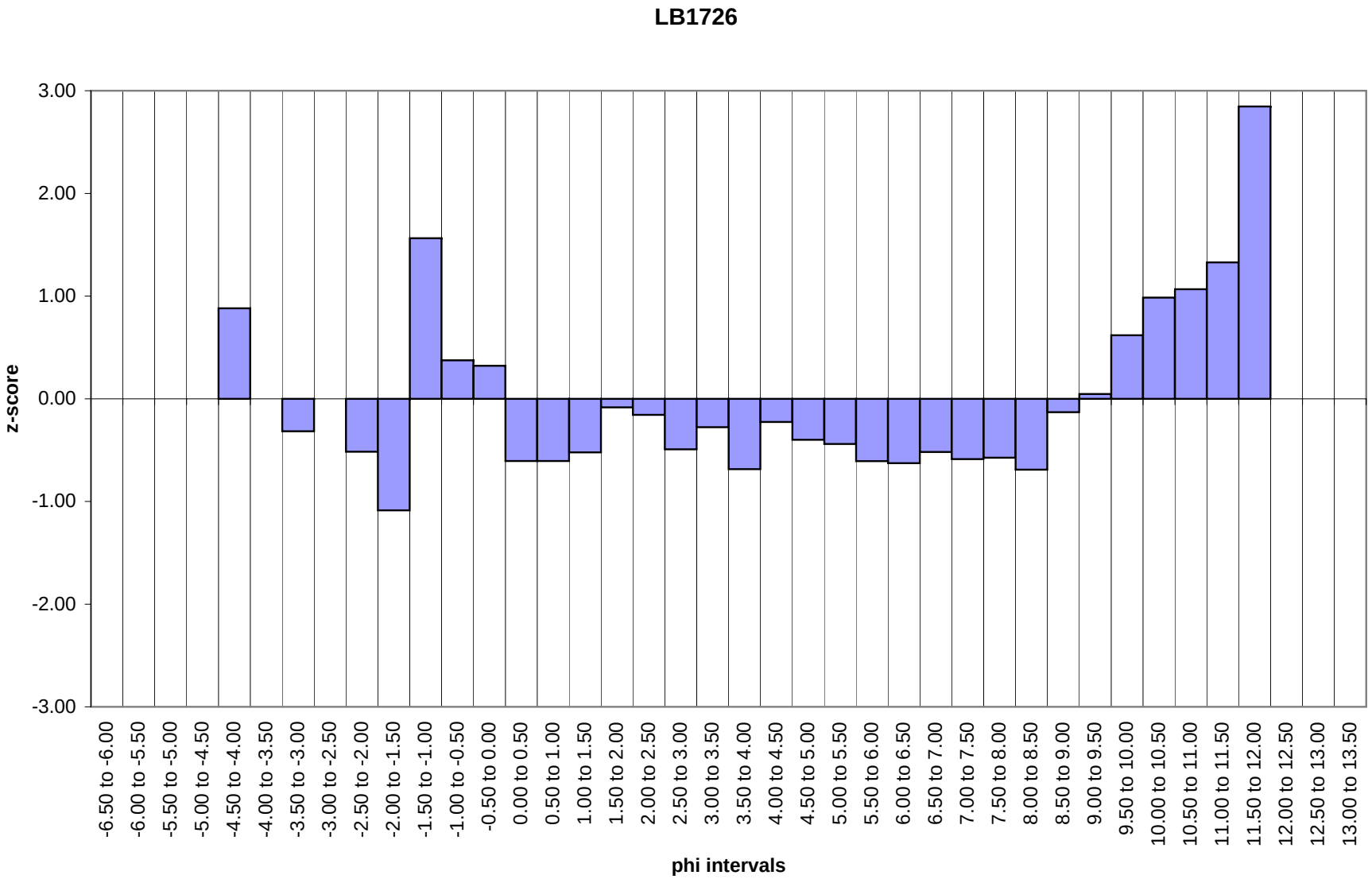
10.00 to 10.50
10.50 to 11.00
11.00 to 11.50
11.50 to 12.00
12.00 to 12.50
12.50 to 13.00
13.00 to 13.50
phi intervals


LB1716
z-score
3.00
2.00
1.00
0.00
-1.00
-2.00
-3.00
-6.50 to -6.00
-6.00 to -5.50
-5.50 to -5.00
-5.00 to -4.50
-4.50 to -4.00
-4.00 to -3.50
-3.50 to -3.00
-3.00 to -2.50
-2.50 to -2.00
-2.00 to -1.50
-1.50 to -1.00
-1.00 to -0.50
-0.50 to 0.00
0.00 to 0.50
0.50 to 1.00
1.00 to 1.50
1.50 to 2.00
2.00 to 2.50
2.50 to 3.00
3.00 to 3.50
3.50 to 4.00
4.00 to 4.50
4.50 to 5.00
5.00 to 5.50
5.50 to 6.00
6.00 to 6.50
6.50 to 7.00
7.00 to 7.50
7.50 to 8.00
8.00 to 8.50
8.50 to 9.00
9.00 to 9.50
9.50 to 10.00
10.00 to 10.50
10.50 to 11.00
11.00 to 11.50
11.50 to 12.00
12.00 to 12.50
12.50 to 13.00
13.00 to 13.50
phi intervals


LB1726
z-score
3.00
2.00
1.00
0.00
-1.00
-2.00
-3.00
-6.50 to -6.00
-6.00 to -5.50
-5.50 to -5.00
-5.00 to -4.50
-4.50 to -4.00
-4.00 to -3.50
-3.50 to -3.00
-3.00 to -2.50
-2.50 to -2.00
-2.00 to -1.50
-1.50 to -1.00
-1.00 to -0.50
-0.50 to 0.00
0.00 to 0.50
0.50 to 1.00
1.00 to 1.50
1.50 to 2.00
2.00 to 2.50
2.50 to 3.00
3.00 to 3.50
3.50 to 4.00
4.00 to 4.50
4.50 to 5.00
5.00 to 5.50
5.50 to 6.00
6.00 to 6.50
6.50 to 7.00
7.00 to 7.50
7.50 to 8.00
8.00 to 8.50
8.50 to 9.00
9.00 to 9.50
9.50 to 10.00
10.00 to 10.50
10.50 to 11.00
11.00 to 11.50
11.50 to 12.00
12.00 to 12.50
12.50 to 13.00
13.00 to 13.50
phi intervals

Appendices

Appendix 1. Final Summary Data sheets as supplied by participating laboratories.

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Exercise Code:	**PS39**
LabCode:	**LB1701**
Sample Code:	**PS391701**

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	Volume/Weight (mark as "-" for not analysed; "0" for no material)
-6.50 to -6.00; 63 mm	**0.00**
-6.00 to -5.50; 45 mm	**0.00**
-5.50 to -5.00; 31.5 mm	**0.00**
-5.00 to -4.50; 22.4 mm	**0.00**
-4.50 to -4.00; 16 mm	**0.00**
-4.00 to -3.50; 11.2 mm	**0.00**
-3.50 to -3.00; 8 mm	**0.00**
-3.00 to -2.50; 5.6 mm	**0.00**
-2.50 to -2.00; 4 mm	**0.06**
-2.00 to -1.50; 2.8 mm	**0.53**
-1.50 to -1.00; 2 mm	**2.62**
-1.00 to -0.50; 1.4 mm	*9.99*
-0.50 to 0.00; 1 mm	*20.06*
0.00 to 0.50; (707 µm)	*0.34*
0.50 to 1.00; (500 µm)	*0.32*
1.00 to 1.50; (353.6 µm)	*1.43*
1.50 to 2.00; (250 µm)	*3.97*
2.00 to 2.50; (176.8 µm)	*6.06*
2.50 to 3.00; (125 µm)	*7.63*
3.00 to 3.50; (88.39 µm)	*5.99*
3.50 to 4.00; (62.5 µm)	*5.10*
4.00 to 4.50; (44.19 µm)	*4.24*
4.50 to 5.00; (31.25 µm)	*3.83*
5.00 to 5.50; (22.097 µm)	*3.60*
5.50 to 6.00; (15.625 µm)	*3.33*
6.00 to 6.50; (11.049 µm)	*3.27*
6.50 to 7.00; (7.813 µm)	*3.39*
7.00 to 7.50; (5.524 µm)	*3.66*
7.50 to 8.00; (3.906 µm)	*3.55*
8.00 to 8.50; (2.762 µm)	*3.12*
8.50 to 9.00; (1.953 µm)	*2.21*
9.00 to 9.50; (1.381 µm)	*1.23*
9.50 to 10.00; (0.977 µm)	*0.43*
10.00 to 10.50; (0.691 µm)	*0.03*
10.50 to 11.00; (0.488 µm)	*0.00*
11.00 to 11.50; (0.345 µm)	*0.00*
11.50 to 12.00; (0.244 µm)	*0.00*
12.00 to 12.50; (0.173 µm)	*0.00*
12.50 to 13.00; (0.122 µm)	*0.00*
13.00 to 13.50; (0.086 µm)	*0.00*

Appendix 1. Final Summary Data sheets as supplied by participating laboratories.

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Exercise Code:	**PS39**
LabCode:	**LB1702**
Sample Code:	**PS391702**

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	**Volume/Weight (mark as "-" for not analysed; "0" for no material)**
-6.50 to -6.00; 63 mm	0.00
-6.00 to -5.50; 45 mm	0.00
-5.50 to -5.00; 31.5 mm	0.00
-5.00 to -4.50; 22.4 mm	0.00
-4.50 to -4.00; 16 mm	5.55
-4.00 to -3.50; 11.2 mm	0.00
-3.50 to -3.00; 8 mm	0.00
-3.00 to -2.50; 5.6 mm	0.00
-2.50 to -2.00; 4 mm	0.01
-2.00 to -1.50; 2.8 mm	0.54
-1.50 to -1.00; 2 mm	3.16
-1.00 to -0.50; 1.4 mm	9.77
-0.50 to 0.00; 1 mm	21.79
0.00 to 0.50; (707 µm)	0.29
0.50 to 1.00; (500 µm)	0.20
1.00 to 1.50; (353.6 µm)	1.58
1.50 to 2.00; (250 µm)	6.26
2.00 to 2.50; (176.8 µm)	10.72
2.50 to 3.00; (125 µm)	12.06
3.00 to 3.50; (88.39 µm)	9.42
3.50 to 4.00; (62.5 µm)	5.45
4.00 to 4.50; (44.19 µm)	2.72
4.50 to 5.00; (31.25 µm)	1.61
5.00 to 5.50; (22.097 µm)	1.24
5.50 to 6.00; (15.625 µm)	1.02
6.00 to 6.50; (11.049 µm)	0.89
6.50 to 7.00; (7.813 µm)	0.88
7.00 to 7.50; (5.524 µm)	0.93
7.50 to 8.00; (3.906 µm)	0.94
8.00 to 8.50; (2.762 µm)	0.85
8.50 to 9.00; (1.953 µm)	0.68
9.00 to 9.50; (1.381 µm)	0.49
9.50 to 10.00; (0.977 µm)	0.37
10.00 to 10.50; (0.691 µm)	0.32
10.50 to 11.00; (0.488 µm)	0.22
11.00 to 11.50; (0.345 µm)	0.05
11.50 to 12.00; (0.244 µm)	-
12.00 to 12.50; (0.173 µm)	
12.50 to 13.00; (0.122 µm)	
13.00 to 13.50; (0.086 µm)	

Appendix 1. Final Summary Data sheets as supplied by participating laboratories.

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Exercise Code:	**PS39**
LabCode:	**LB1705**
Sample Code:	**PS391705**

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	**Volume/Weight (mark as "-" for not analysed; "0" for no material)**
-6.50 to -6.00; 63 mm	-
-6.00 to -5.50; 45 mm	-
-5.50 to -5.00; 31.5 mm	-
-5.00 to -4.50; 22.4 mm	-
-4.50 to -4.00; 16 mm	-
-4.00 to -3.50; 11.2 mm	-
-3.50 to -3.00; 8 mm	**7.6600**
-3.00 to -2.50; 5.6 mm	**0.0000**
-2.50 to -2.00; 4 mm	**0.0400**
-2.00 to -1.50; 2.8 mm	**0.8200**
-1.50 to -1.00; 2 mm	**4.1400**
-1.00 to -0.50; 1.4 mm	**13.9300**
-0.50 to 0.00; 1 mm	**29.4300**
0.00 to 0.50; (707 µm)	*0.0000*
0.50 to 1.00; (500 µm)	*0.0126*
1.00 to 1.50; (353.6 µm)	*0.8182*
1.50 to 2.00; (250 µm)	*3.2981*
2.00 to 2.50; (176.8 µm)	*5.5765*
2.50 to 3.00; (125 µm)	*7.5528*
3.00 to 3.50; (88.39 µm)	*6.3444*
3.50 to 4.00; (62.5 µm)	*5.5702*
4.00 to 4.50; (44.19 µm)	*4.2359*
4.50 to 5.00; (31.25 µm)	*3.7386*
5.00 to 5.50; (22.097 µm)	*3.7009*
5.50 to 6.00; (15.625 µm)	*3.1911*
6.00 to 6.50; (11.049 µm)	*3.0148*
6.50 to 7.00; (7.813 µm)	*3.1218*
7.00 to 7.50; (5.524 µm)	*3.1470*
7.50 to 8.00; (3.906 µm)	*3.2288*
8.00 to 8.50; (2.762 µm)	*6.3947*
8.50 to 9.00; (1.953 µm)	-
9.00 to 9.50; (1.381 µm)	-
9.50 to 10.00; (0.977 µm)	-
10.00 to 10.50; (0.691 µm)	-
10.50 to 11.00; (0.488 µm)	-
11.00 to 11.50; (0.345 µm)	-
11.50 to 12.00; (0.244 µm)	-
12.00 to 12.50; (0.173 µm)	-
12.50 to 13.00; (0.122 µm)	-
13.00 to 13.50; (0.086 µm)	-

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Exercise Code:	**PS39**
LabCode:	**LB1707**
Sample Code:	**PS391707**

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	**Volume % (mark as "-" for not analysed; "0" for no material)**
-6.50 to -6.00; 63 mm	0.00
-6.00 to -5.50; 45 mm	0.00
-5.50 to -5.00; 31.5 mm	0.00
-5.00 to -4.50; 22.4 mm	0.00
-4.50 to -4.00; 16 mm	5.34
-4.00 to -3.50; 11.2 mm	0.00
-3.50 to -3.00; 8 mm	0.00
-3.00 to -2.50; 5.6 mm	0.00
-2.50 to -2.00; 4 mm	0.00
-2.00 to -1.50; 2.8 mm	0.65
-1.50 to -1.00; 2 mm	2.71
-1.00 to -0.50; 1.4 mm	10.26
-0.50 to 0.00; 1 mm	19.52
0.00 to 0.50; (707 µm)	5.47
0.50 to 1.00; (500 µm)	0.12
1.00 to 1.50; (353.6 µm)	0.08
1.50 to 2.00; (250 µm)	0.36
2.00 to 2.50; (176.8 µm)	2.89
2.50 to 3.00; (125 µm)	8.98
3.00 to 3.50; (88.39 µm)	6.93
3.50 to 4.00; (62.5 µm)	5.94
4.00 to 4.50; (44.19 µm)	1.74
4.50 to 5.00; (31.25 µm)	2.31
5.00 to 5.50; (22.097 µm)	2.77
5.50 to 6.00; (15.625 µm)	3.06
6.00 to 6.50; (11.049 µm)	3.18
6.50 to 7.00; (7.813 µm)	3.13
7.00 to 7.50; (5.524 µm)	2.97
7.50 to 8.00; (3.906 µm)	2.78
8.00 to 8.50; (2.762 µm)	2.62
8.50 to 9.00; (1.953 µm)	2.42
9.00 to 9.50; (1.381 µm)	1.98
9.50 to 10.00; (0.977 µm)	1.24
10.00 to 10.50; (0.691 µm)	0.49
10.50 to 11.00; (0.488 µm)	0.05
11.00 to 11.50; (0.345 µm)	0.00
>11.50; (<0.345 µm)	0.00

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Exercise Code:	**PS39**
LabCode:	**LB1712**
Sample Code:	**PS391712**

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	**Volume/Weight (mark as "-" for not analysed; "0" for no material)**
% >14 mm	8.8915
% > 2 mm	3.3460
% > 1 mm	29.2469
% > 500 µm	1.2269
% > 250 µm	3.1909
% > 125 µm	10.5415
% > 63 µm	10.3667
% > 63 µm	33.1896

**Final sieve and laser data re-merged for analysis by Thomson Unicomarine.*

Appendix 1. Final Summary Data sheets as supplied by participating laboratories.

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Exercise Code:	**PS39**
LabCode:	**LB1713**
Sample Code:	**PS391713**

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	**Volume/Weight (mark as "-" for not analysed; "0" for no material)**
-6.50 to -6.00; 63 mm	**0.0000**
-6.00 to -5.50; 45 mm	**0.0000**
-5.50 to -5.00; 31.5 mm	**0.0000**
-5.00 to -4.50; 22.4 mm	**0.0000**
-4.50 to -4.00; 16 mm	3.078817734
-4.00 to -3.50; 11.2 mm	0
-3.50 to -3.00; 8 mm	0
-3.00 to -2.50; 5.6 mm	0
-2.50 to -2.00; 4 mm	0
-2.00 to -1.50; 2.8 mm	0.314251741
-1.50 to -1.00; 2 mm	1.537285544
-1.00 to -0.50; 1.4 mm	5.732970953
-0.50 to 0.00; 1 mm	10.77373875
0.00 to 0.50; (707 µm)	0.580458747
0.50 to 1.00; (500 µm)	0.086992956
1.00 to 1.50; (353.6 µm)	0.592199315
1.50 to 2.00; (250 µm)	2.508830094
2.00 to 2.50; (176.8 µm)	4.946229774
2.50 to 3.00; (125 µm)	6.568108712
3.00 to 3.50; (88.39 µm)	6.86171128
3.50 to 4.00; (62.5 µm)	6.405224763
4.00 to 4.50; (44.19 µm)	5.841748053
4.50 to 5.00; (31.25 µm)	5.333925452
5.00 to 5.50; (22.097 µm)	4.862970418
5.50 to 6.00; (15.625 µm)	4.527705518
6.00 to 6.50; (11.049 µm)	4.501905047
6.50 to 7.00; (7.813 µm)	4.781853646
7.00 to 7.50; (5.524 µm)	5.097206732
7.50 to 8.00; (3.906 µm)	5.061684903
8.00 to 8.50; (2.762 µm)	4.418387674
8.50 to 9.00; (1.953 µm)	3.200452229
9.00 to 9.50; (1.381 µm)	1.74519741
9.50 to 10.00; (0.977 µm)	0.595662023
10.00 to 10.50; (0.691 µm)	0.044480536
10.50 to 11.00; (0.488 µm)	0
11.00 to 11.50; (0.345 µm)	0
11.50 to 12.00; (0.244 µm)	0
12.00 to 12.50; (0.173 µm)	0
12.50 to 13.00; (0.122 µm)	0
13.00 to 13.50; (0.086 µm)	0

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Exercise Code:	**PS39**
LabCode:	**LB1715**
Sample Code:	**PS391715**

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	**Volume/Weight (mark as "-" for not analysed; "0" for no material)**
-6.50 to -6.00; 63 mm	-
-6.00 to -5.50; 45 mm	-
-5.50 to -5.00; 31.5 mm	-
-5.00 to -4.50; 22.4 mm	-
-4.50 to -4.00; 16 mm	-
-4.00 to -3.50; 11.2 mm	-
-3.50 to -3.00; 8 mm	-
-3.00 to -2.50; 5.6 mm	-
-2.50 to -2.00; 4 mm	-
-2.00 to -1.50; 2.8 mm	-
-1.50 to -1.00; 2 mm	-
-1.00 to -0.50; 1.4 mm	*26.7900*
-0.50 to 0.00; 1 mm	*12.9200*
0.00 to 0.50; (707 µm)	*5.4600*
0.50 to 1.00; (500 µm)	*1.5300*
1.00 to 1.50; (353.6 µm)	*1.2500*
1.50 to 2.00; (250 µm)	*1.2200*
2.00 to 2.50; (176.8 µm)	*3.8300*
2.50 to 3.00; (125 µm)	*5.3900*
3.00 to 3.50; (88.39 µm)	*3.6600*
3.50 to 4.00; (62.5 µm)	*4.3400*
4.00 to 4.50; (44.19 µm)	*4.0500*
4.50 to 5.00; (31.25 µm)	*3.7700*
5.00 to 5.50; (22.097 µm)	*2.2800*
5.50 to 6.00; (15.625 µm)	*3.1600*
6.00 to 6.50; (11.049 µm)	*3.3400*
6.50 to 7.00; (7.813 µm)	*2.4000*
7.00 to 7.50; (5.524 µm)	*3.2900*
7.50 to 8.00; (3.906 µm)	*3.2300*
8.00 to 8.50; (2.762 µm)	*2.8100*
8.50 to 9.00; (1.953 µm)	*1.6900*
9.00 to 9.50; (1.381 µm)	*1.6200*
9.50 to 10.00; (0.977 µm)	*1.0300*
10.00 to 10.50; (0.691 µm)	*0.4900*
10.50 to 11.00; (0.488 µm)	*0.3680*
11.00 to 11.50; (0.345 µm)	*0.0920*
11.50 to 12.00; (0.244 µm)	-
12.00 to 12.50; (0.173 µm)	-
12.50 to 13.00; (0.122 µm)	-
13.00 to 13.50; (0.086 µm)	-

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Exercise Code:	**PS39**
LabCode:	**LB1716**
Sample Code:	**PS391716**

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	**Volume/Weight (mark as "-" for not analysed; "0" for no material)**
-6.50 to -6.00; 63 mm	
-6.00 to -5.50; 45 mm	
-5.50 to -5.00; 31.5 mm	
-5.00 to -4.50; 22.4 mm	
-4.50 to -4.00; 16 mm	**4.6735**
-4.00 to -3.50; 11.2 mm	
-3.50 to -3.00; 8 mm	
-3.00 to -2.50; 5.6 mm	
-2.50 to -2.00; 4 mm	
-2.00 to -1.50; 2.8 mm	
-1.50 to -1.00; 2 mm	**0.0000**
-1.00 to -0.50; 1.4 mm	*0.0000*
-0.50 to 0.00; 1 mm	*0.0000*
0.00 to 0.50; (707 µm)	*0.0000*
0.50 to 1.00; (500 µm)	*0.0095*
1.00 to 1.50; (353.6 µm)	*1.4966*
1.50 to 2.00; (250 µm)	*5.3002*
2.00 to 2.50; (176.8 µm)	*9.4183*
2.50 to 3.00; (125 µm)	*10.9149*
3.00 to 3.50; (88.39 µm)	*9.3325*
3.50 to 4.00; (62.5 µm)	*6.8063*
4.00 to 4.50; (44.19 µm)	*5.2811*
4.50 to 5.00; (31.25 µm)	*4.8045*
5.00 to 5.50; (22.097 µm)	*4.5661*
5.50 to 6.00; (15.625 µm)	*4.2706*
6.00 to 6.50; (11.049 µm)	*4.1753*
6.50 to 7.00; (7.813 µm)	*4.4041*
7.00 to 7.50; (5.524 µm)	*4.6805*
7.50 to 8.00; (3.906 µm)	*4.6710*
8.00 to 8.50; (2.762 µm)	*4.2420*
8.50 to 9.00; (1.953 µm)	*3.4413*
9.00 to 9.50; (1.381 µm)	*2.4785*
9.50 to 10.00; (0.977 µm)	*1.8112*
10.00 to 10.50; (0.691 µm)	*1.5252*
10.50 to 11.00; (0.488 µm)	*1.2011*
11.00 to 11.50; (0.345 µm)	*0.5148*
11.50 to 12.00; (0.244 µm)	*0.0000*
12.00 to 12.50; (0.173 µm)	*0.0000*
12.50 to 13.00; (0.122 µm)	*0.0000*
13.00 to 13.50; (0.086 µm)	*0.0000*

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Exercise Code:	**PS39**
LabCode:	**LB1726**
Sample Code:	**PS391726**

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	**Volume/Weight (mark as "-" for not analysed; "0" for no material)**
-6.50 to -6.00; 63 mm	-
-6.00 to -5.50; 45 mm	-
-5.50 to -5.00; 31.5 mm	-
-5.00 to -4.50; 22.4 mm	-
-4.50 to -4.00; 16 mm	**5.6158**
-4.00 to -3.50; 11.2 mm	-
-3.50 to -3.00; 8 mm	**0.0000**
-3.00 to -2.50; 5.6 mm	-
-2.50 to -2.00; 4 mm	**0.0000**
-2.00 to -1.50; 2.8 mm	-
-1.50 to -1.00; 2 mm	**4.5578**
-1.00 to -0.50; 1.4 mm	*12.5475*
-0.50 to 0.00; 1 mm	*18.4346*
0.00 to 0.50; (707 µm)	*0.0000*
0.50 to 1.00; (500 µm)	*0.0039*
1.00 to 1.50; (353.6 µm)	*0.7218*
1.50 to 2.00; (250 µm)	*3.0305*
2.00 to 2.50; (176.8 µm)	*5.5902*
2.50 to 3.00; (125 µm)	*6.8142*
3.00 to 3.50; (88.39 µm)	*6.2002*
3.50 to 4.00; (62.5 µm)	*4.8056*
4.00 to 4.50; (44.19 µm)	*3.7268*
4.50 to 5.00; (31.25 µm)	*3.1305*
5.00 to 5.50; (22.097 µm)	*2.7716*
5.50 to 6.00; (15.625 µm)	*2.5499*
6.00 to 6.50; (11.049 µm)	*2.4989*
6.50 to 7.00; (7.813 µm)	*2.5891*
7.00 to 7.50; (5.524 µm)	*2.7010*
7.50 to 8.00; (3.906 µm)	*2.6794*
8.00 to 8.50; (2.762 µm)	*2.4146*
8.50 to 9.00; (1.953 µm)	*1.9419*
9.00 to 9.50; (1.381 µm)	*1.4397*
9.50 to 10.00; (0.977 µm)	*1.1298*
10.00 to 10.50; (0.691 µm)	*0.9768*
10.50 to 11.00; (0.488 µm)	*0.7611*
11.00 to 11.50; (0.345 µm)	*0.3550*
11.50 to 12.00; (0.244 µm)	*0.0118*
12.00 to 12.50; (0.173 µm)	*0.0000*
12.50 to 13.00; (0.122 µm)	*0.0000*
13.00 to 13.50; (0.086 µm)	*0.0000*

Appendix 2. z-score calculations.

	-6.50 to -6.00	-6.00 to -5.50	-5.50 to -5.00	-5.00 to -4.50	-4.50 to -4.00	z-score	-4.00 to -3.50	-3.50 to -3.00	z-score	-3.00 to -2.50	-2.50 to -2.00	z-score	-2.00 to -1.50	z-score
LB1701	0.0000	0.0000	0.0000	0.0000	0.0000	-1.37	0.0000	0.0000	-0.32	0.0000	0.0551	2.37	0.5276	0.57
LB1702	0.0000	0.0000	0.0000	0.0000	5.5494	0.85	0.0000	0.0000	-0.32	0.0000	0.0100	0.01	0.5399	0.61
LB1705	0.0000	0.0000	0.0000	0.0000	0.0000	-1.37	0.0000	6.4388	2.85	0.0000	0.0336	1.24	0.6893	1.08
LB1707	0.0000	0.0000	0.0000	0.0000	5.3357	0.77	0.0000	0.0000	-0.32	0.0000	0.0000	-0.52	0.6543	0.97
LB1712	0.0000	0.0000	0.0000	0.0000	4.1866	0.31	0.0000	0.0000	-0.32	0.0000	0.0000	-0.52	0.0000	-1.09
LB1713	0.0000	0.0000	0.0000	0.0000	3.0788	-0.14	0.0000	0.0000	-0.32	0.0000	0.0000	-0.52	0.3143	-0.10
LB1715	0.0000	0.0000	0.0000	0.0000	0.0000	-1.37	0.0000	0.0000	-0.32	0.0000	0.0000	-0.52	0.0000	-1.09
LB1716	0.0000	0.0000	0.0000	0.0000	4.6726	0.50	0.0000	0.0000	-0.32	0.0000	0.0000	-0.52	0.0000	-1.09
LB1726	0.0000	0.0000	0.0000	0.0000	5.6158	0.88	0.0000	0.0000	-0.32	0.0000	0.0000	-0.52	0.0000	-1.09
BENCHMARK	0.0000	0.0000	0.0000	0.0000	5.7693	0.94	0.0000	0.0000	-0.32	0.0000	0.0000	-0.52	0.7286	1.21
mean	0.0000	0.0000	0.0000	0.0000	3.4208		0.0000	0.6439		0.0000	0.0099		0.3454	
St.Dev	0.0000	0.0000	0.0000	0.0000	2.4924		0.0000	2.0361		0.0000	0.0191		0.3179	

	-1.50 to -1.00	z-score	-1.00 to -0.50	z-score	-0.50 to 0.00	z-score	0.00 to 0.50	z-score	0.50 to 1.00	z-score	1.00 to 1.50	z-score	1.50 to 2.00	z-score
LB1701	2.6223	0.25	9.9929	0.03	20.0567	0.55	0.3389	-0.45	0.3201	0.07	1.4325	0.98	3.9688	0.46
LB1702	3.1597	0.61	9.7690	0.00	21.7878	0.79	0.2900	-0.47	0.2000	-0.19	1.5798	1.29	6.2594	1.78
LB1705	3.4800	0.83	11.7092	0.26	24.7381	1.21	0.0000	-0.61	0.0106	-0.59	0.6878	-0.59	2.7723	-0.23
LB1707	2.7127	0.31	10.2615	0.07	19.5217	0.47	5.4728	1.87	0.1248	-0.35	0.0845	-1.86	0.3583	-1.62
LB1712	1.5755	-0.46	0.0000	-1.29	13.7711	-0.34	1.1835	-0.07	0.5036	0.47	1.0147	0.10	3.3732	0.11
LB1713	1.5373	-0.49	5.7330	-0.53	10.7737	-0.76	0.5805	-0.34	0.0870	-0.43	0.5922	-0.79	2.5088	-0.38
LB1715	0.0000	-1.53	26.7873	2.27	12.9187	-0.46	5.4595	1.87	1.5298	2.67	1.2499	0.59	1.2199	-1.13
LB1716	0.0000	-1.53	0.0000	-1.29	0.0000	-2.27	0.0000	-0.61	0.0095	-0.59	1.4963	1.11	5.2991	1.22
LB1726	4.5578	1.56	12.5475	0.37	18.4346	0.32	0.0000	-0.61	0.0039	-0.61	0.7218	-0.52	3.0305	-0.08
BENCHMARK	2.8985	0.44	10.5150	0.10	19.5411	0.48	0.0459	-0.59	0.0718	-0.46	0.8350	-0.28	2.9628	-0.12
mean	2.2544		9.7315		16.1544		1.3371		0.2861		0.9695		3.1753	
St.Dev	1.4730		7.5211		7.1080		2.2065		0.4650		0.4749		1.7360	

z-score = 0

Appendix 2. z-score calculations.

	2.00 to 2.50	z-score	2.50 to 3.00	z-score	3.00 to 3.50	z-score	3.50 to 4.00	z-score	4.00 to 4.50	z-score	4.50 to 5.00	z-score	5.00 to 5.50	z-score
LB1701	6.0640	0.04	7.6293	-0.12	5.9944	-0.39	5.1009	-0.36	4.2404	0.19	3.8305	0.21	3.6040	0.31
LB1702	10.7189	1.97	12.0588	1.92	9.4191	1.52	5.4495	0.02	2.7197	-1.04	1.6098	-1.73	1.2399	-1.82
LB1705	4.6874	-0.53	6.3487	-0.71	5.3329	-0.76	4.6822	-0.82	3.5606	-0.36	3.1426	-0.39	3.1109	-0.13
LB1707	2.8912	-1.28	8.9813	0.50	6.9302	0.13	5.9356	0.55	1.7392	-1.83	2.3063	-1.12	2.7662	-0.44
LB1712	6.3927	0.18	8.1033	0.10	7.8012	0.61	6.4543	1.11	5.2756	1.02	4.6329	0.92	4.3134	0.95
LB1713	4.9462	-0.42	6.5681	-0.61	6.8617	0.09	6.4052	1.06	5.8417	1.48	5.3339	1.53	4.8630	1.45
LB1715	3.8296	-0.89	5.3895	-1.15	3.6596	-1.69	4.3396	-1.19	4.0496	0.03	3.7696	0.16	2.2798	-0.88
LB1716	9.4165	1.43	10.9128	1.39	9.3307	1.47	6.8050	1.50	5.2801	1.03	4.8035	1.06	4.5653	1.18
LB1726	5.5902	-0.16	6.8142	-0.49	6.2002	-0.28	4.8056	-0.69	3.7268	-0.23	3.1305	-0.40	2.7716	-0.44
BENCHMARK	5.1318	-0.35	6.0569	-0.84	5.4531	-0.69	4.3562	-1.18	3.6402	-0.30	3.3086	-0.24	3.0813	-0.16
mean	5.9669		7.8863		6.6983		5.4334		4.0074		3.5868		3.2595	
St.Dev	2.4087		2.1785		1.7957		0.9157		1.2412		1.1427		1.1095	

	5.50 to 6.00	z-score	6.00 to 6.50	z-score	6.50 to 7.00	z-score	7.00 to 7.50	z-score	7.50 to 8.00	z-score	8.00 to 8.50;	z-score	8.50 to 9.00	z-score
LB1701	3.3330	0.16	3.2666	0.10	3.3877	0.16	3.6577	0.18	3.5516	0.14	3.1199	-0.14	2.2135	0.12
LB1702	1.0199	-2.11	0.8899	-2.15	0.8799	-1.97	0.9299	-2.01	0.9399	-1.99	0.8499	-1.91	0.6799	-1.29
LB1705	2.6823	-0.48	2.5342	-0.59	2.6241	-0.49	2.6453	-0.63	2.7141	-0.55	5.3752	1.62	0.0000	-1.92
LB1707	3.0635	-0.10	3.1811	0.02	3.1292	-0.06	2.9702	-0.37	2.7835	-0.49	2.6175	-0.53	2.4169	0.31
LB1712	4.1661	0.98	4.2472	1.03	4.5311	1.13	4.7888	1.09	4.6879	1.06	4.1346	0.65	3.0183	0.86
LB1713	4.5277	1.33	4.5019	1.27	4.7819	1.34	5.0972	1.34	5.0617	1.37	4.4184	0.87	3.2005	1.03
LB1715	3.1597	-0.01	3.3397	0.17	2.3998	-0.68	3.2897	-0.11	3.2297	-0.13	2.8097	-0.38	1.6898	-0.36
LB1716	4.2698	1.08	4.1745	0.96	4.4032	1.02	4.6796	1.01	4.6701	1.05	4.2412	0.74	3.4406	1.25
LB1726	2.5499	-0.61	2.4989	-0.63	2.5891	-0.52	2.7010	-0.59	2.6794	-0.57	2.4146	-0.69	1.9419	-0.13
BENCHMARK	2.9280	-0.24	2.9880	-0.16	3.2723	0.06	3.5524	0.10	3.5148	0.11	3.0044	-0.23	2.2332	0.14
mean	3.1700		3.1622		3.1998		3.4312		3.3833		3.2985		2.0835	
St.Dev	1.0213		1.0576		1.1783		1.2420		1.2255		1.2803		1.0852	

z-score = 0

Appendix 2. z-score calculations.

	9.00 to 9.50	z-score	9.50 to 10.00	z-score	10.00 to 10.50	z-score	10.50 to 11.00	z-score	11.00 to 11.50	z-score	11.50 to 12.00	z-score	12.00 to 12.50	12.50 to 13.00	13.00 to 13.50
LB1701	1.2330	-0.25	0.4277	-0.65	0.0308	-0.86	0.0000	-0.77	0.0000	-0.65	0.0000	-0.32	0.0000	0.0000	0.0000
LB1702	0.4900	-1.29	0.3700	-0.75	0.3200	-0.30	0.2200	-0.24	0.0500	-0.37	0.0000	-0.32	0.0000	0.0000	0.0000
LB1705	0.0000	-1.98	0.0000	-1.42	0.0000	-0.92	0.0000	-0.77	0.0000	-0.65	0.0000	-0.32	0.0000	0.0000	0.0000
LB1707	1.9778	0.80	1.2448	0.83	0.4875	0.03	0.0519	-0.65	0.0000	-0.65	0.0000	-0.32	0.0000	0.0000	0.0000
LB1712	1.6080	0.28	0.2364	-1.00	0.0000	-0.92	0.0000	-0.77	0.0000	-0.65	0.0000	-0.32	0.0000	0.0000	0.0000
LB1713	1.7452	0.48	0.5957	-0.35	0.0445	-0.84	0.0000	-0.77	0.0000	-0.65	0.0000	-0.32	0.0000	0.0000	0.0000
LB1715	1.6198	0.30	1.0299	0.44	0.4900	0.03	0.3680	0.12	0.0920	-0.14	0.0000	-0.32	0.0000	0.0000	0.0000
LB1716	2.4780	1.51	1.8109	1.85	1.5249	2.06	1.2009	2.13	0.5147	2.22	0.0000	-0.32	0.0000	0.0000	0.0000
LB1726	1.4397	0.05	1.1298	0.62	0.9768	0.99	0.7611	1.07	0.3550	1.33	0.0118	2.85	0.0000	0.0000	0.0000
BENCHMARK	1.4789	0.10	1.0281	0.44	0.8530	0.74	0.5955	0.67	0.1553	0.22	0.0000	-0.32	0.0000	0.0000	0.0000
mean	1.4070		0.7873		0.4727		0.3197		0.1167		0.0012		0.0000	0.0000	0.0000
St.Dev	0.7095		0.5532		0.5116		0.4137		0.1795		0.0037		0.0000	0.0000	0.0000

z-score = 0