

VI. GRAVITY DATA

Yoshiaki ABE*

Observer: Yoshiaki Abe

Measurements of gravity with the use of a LaCoste and Romberg Model G gravity meter (No. G183) were carried out in 1973-1974 at a total of 177 stations along the oversnow traverse routes of JARE-14: 74 stations along route S-H-Z, 61 stations along route M, and 42 stations along routes X, C, D, A and S (see Fig. A and report I in this volume). At each station the measurement was made on the snow or ice surface just beside the station pole by reading the gravity meter one time.

The total drift was 1.62 mgals in 15 days during the traverse along route M in September-October 1973 and 0.43 mgals in 69 days during the traverse along the route of Mizuho Camp-Yamato Mountains-Mizuho Camp in November 1973-January 1974. The gravity value at each station was calculated with reference to the pendulum gravity value at Syowa Station, 982.5394 ± 0.0005 gals.

Table 1 shows the following values: g (the observed gravity value at a station), g_0 (the gravity value reduced to sea level by the application of free air reduction), r_0 (the standard gravity value to be determined by the value of the latitude at the station), and Δg_0 (the free air anomaly).

No correction for the topographic condition was made because of the simple and fairly even topographic features of the surface of the ice sheet. Positions, elevations and ice thicknesses of stations are tabulated in report II. The gravity values obtained in Mizuho

* Geographical Survey Institute, Ministry of Construction, Otemaenochō, Higashi-ku, Osaka 540.

Plateau by the traverse parties of JARE-9, -10 and -11 in 1968-1971 were published in reports (Yanai and Kakinuma, 1971; Yoshida and Yoshimura, 1972).

References

- Yanai, K. and S. Kakinuma (1971): Measurement of gravity along the traverse route Syowa-South Pole. Report of the Japanese traverse Syowa-South Pole 1968-1969. JARE Sci. Rep., Spec. Issue, 2, 131-150.
- Yoshida, M. and A. Yoshimura (1972): Gravimetric survey in the Mizuho Plateau-West Enderby Land area, East Antarctica, 1969-1971. Glaciological Research Program in Mizuho Plateau-West Enderby Land, Part 1, 1969-1971. JARE Data Rep., 17 (Glaciology), 168-203.

Table 1. Gravity data in Mizuho Plateau, 1973-1974.

g: observed value, g_0 : gravity value reduced to sea level, r_0 : standard gravity value, and Δg_0 : free air anomaly.

Positions, elevations, and ice thicknesses of stations should be referred to report II.

Station	g (mgal)	g_0 (mgal)	r_0 (mgal)	Δg_0 (mgal)
Syowa Station	982 539.4	982 543.7	982 554.8	-11.0
S 16	407.7	578.6	556.4	22.3
S 17-3	395.7	580.8	556.1	24.7
S 19	355.1	552.0	555.8	-3.8
S 21-3	345.9	574.3	556.0	18.3
S 24-1	320.9	581.0	556.3	24.7
S 25	313.8	581.7	556.5	25.2
S 26-5	298.6	581.0	556.8	24.2
S 30	276.3	581.2	557.5	23.7
H 17	262.7	582.1	559.7	22.4
H 27	253.1	583.6	560.8	22.8
H 34-1	249.8	586.1	561.6	24.5
H 45	240.8	587.7	562.8	24.9
H 59	235.4	588.7	564.4	24.3
H 65	234.4	593.0	565.4	27.5

Station	g (mgal)	g _o (mgal)	r _o (mgal)	△g _o (mgal)
H 70	982 228.5	982 594.5	982 566.4	28.0
H 77	221.9	597.4	567.8	29.6
H 84	206.6	591.4	569.2	22.2
H 89	203.9	591.5	570.0	21.5
H101-1	193.6	597.5	572.6	24.9
H104-1	186.8	594.8	573.2	21.5
H113-1	181.6	594.8	575.0	19.8
H124	174.1	597.8	577.2	20.6
H127	173.3	598.5	577.9	20.6
H131-1	171.3	598.7	579.1	19.6
H143	167.1	604.1	581.8	22.3
H148-1	160.5	605.2	583.1	22.1
H155	151.6	603.7	584.5	19.2
H166	136.6	597.1	586.8	10.3
H174	128.1	598.4	588.5	9.9
H184	114.4	591.5	590.6	0.9
H189	110.9	591.1	591.7	-0.6
H194	110.4	591.9	592.8	-0.9
H201	110.9	600.4	594.3	6.0
H207	110.2	604.6	595.6	9.0
H219	110.4	613.5	598.0	15.5
H225	111.0	619.8	599.3	20.6
H231	111.2	625.6	600.6	25.0
H243	116.4	639.8	603.3	36.5
H245-1	112.7	641.9	603.9	38.1
H251-1	106.5	642.3	605.0	37.2
H256	105.2	642.7	605.9	36.8
H266	108.9	654.8	607.9	46.9
H275-1	112.4	669.1	609.9	59.2
H289	108.1	681.2	612.9	68.2
H291-1	105.2	682.0	613.5	68.5
H295-1	100.2	680.7	614.5	66.2
S122	094.7	684.2	615.1	69.1
Z 4-1	084.4	687.1	617.1	70.1
Z 6-1	075.9	682.6	617.8	64.9
Z 8	072.9	681.1	618.4	62.7
Z 11-1	064.2	676.4	619.9	56.5
Z 16	068.9	682.4	621.9	60.5
Z 19	049.9	670.2	623.2	47.0
Z 22-1	049.3	669.9	624.8	45.1
Z 26	048.3	676.6	626.4	50.2
Z 31	046.4	681.8	628.5	53.4
Z 35	047.4	686.2	630.2	56.0
Z 37	045.9	686.0	631.1	54.9
Z 38-1	039.8	684.5	631.5	52.9

Station	g (mgal)	g _o (mgal)	r _o (mgal)	△g _o (mgal)
Z 42-1	982 031.2	982 678.3	982 633.4	44.9
Z 45	028.0	671.8	634.0	37.8
Z 53-1	030.8	680.1	635.8	44.3
Z 66	010.9	669.1	638.4	30.7
Z 70	002.4	662.5	639.3	23.2
Z 73-1	981 986.0	651.7	640.8	10.9
Z 79-2	984.0	652.4	643.4	9.1
Z 81-2	987.3	656.0	644.2	11.8
Z 88-1	982 007.5	677.5	647.1	30.4
Z 90	008.6	680.1	647.8	32.3
Z 92	007.1	680.1	648.7	31.5
Z 94	006.7	681.3	649.6	31.7
Z 97-2	003.7	682.9	651.2	31.7
Z101	004.4	683.9	652.6	31.3
Mizuho Camp	981 998.7	686.9	654.0	33.0
X 5	982 001.3	653.7	655.1	-1.4
X 10	011.0	657.2	656.6	0.6
X 13	014.2	655.5	657.8	-2.3
X 14	012.1	650.6	658.2	-7.6
X 17	023.2	659.0	659.1	-0.2
C 15	177.4	721.5	684.8	36.7
C 20	142.9	687.2	681.9	5.3
C 30	131.1	684.1	678.4	5.7
C 37	160.1	717.1	678.2	38.9
C 50	138.2	692.5	677.6	14.9
C 60	101.8	635.4	677.1	-41.7
C 64	124.0	661.3	676.9	-15.7
C 75	163.6	703.4	676.4	27.0
C 87	111.6	672.4	676.3	-3.9
C 98	117.1	680.0	676.5	3.5
C110	094.1	677.0	676.7	0.3
C120	055.8	668.1	677.0	-8.9
C125	045.9	653.2	674.2	-21.0
C130	042.3	652.7	671.4	-18.6
C135	044.8	661.4	668.5	-7.1
C140	047.1	664.9	665.7	-0.8
C145	044.7	671.5	662.8	8.7
D 0	214.6	732.4	688.6	43.8
D 7	231.9	738.6	688.4	50.2
D 10	226.5	731.7	690.3	41.4
B 12	222.0	836.5	711.1	125.3
A013	105.3	826.1	716.9	109.2
A021	055.5	793.6	717.7	76.0
A023	063.0	798.1	716.8	81.4

Station	g (mgal)	g _o (mgal)	r _o (mgal)	△g _o (mgal)
A024	982 067.1	982 802.5	982 717.7	84.8
A055	054.8	797.2	720.5	76.7
A065	056.7	793.0	720.3	72.7
A073	034.8	780.4	721.1	59.2
S169	035.6	663.6	661.0	2.6
S170	045.6	673.3	662.1	11.2
S180	059.6	699.9	669.9	30.1
S190	038.9	711.7	679.3	32.3
S200	012.5	710.2	688.8	21.4
S210	003.7	723.4	698.1	25.3
S220	981 995.1	738.8	707.2	31.6
S230	982.0	755.4	716.4	39.0
S240	973.5	773.1	725.5	47.6
M 1	982 071.1	685.8	621.1	64.7
M 2	066.4	682.7	620.2	62.5
M 3	056.4	674.8	619.2	55.6
M 4	046.3	666.6	618.2	48.3
M 5	044.9	668.6	617.3	51.3
M 6	045.2	671.0	616.3	54.7
M 7	038.8	669.3	615.8	53.4
M 8	034.1	663.4	614.9	48.5
M 9	030.6	661.7	613.9	47.8
M 10	058.2	690.8	612.9	77.9
M 11	058.7	693.8	611.9	81.8
M 12	061.7	697.5	611.0	86.5
M 13	066.8	700.9	610.0	90.9
M 14	069.3	705.6	609.5	96.1
M 15	071.1	708.7	608.5	100.2
M 16	073.9	712.7	607.6	105.2
M 17	074.3	718.4	606.6	111.8
M 18	073.1	720.8	605.6	115.2
M 19	074.5	725.6	604.6	121.0
M 20	074.0	727.3	603.7	123.6
M 21	067.3	721.0	602.7	118.3
M 22	061.5	717.9	602.2	115.7
M 23	077.7	732.6	601.2	131.3
M 24	078.8	734.2	600.2	134.0
M 25	070.3	724.2	599.7	124.5
M 26	065.8	718.5	598.8	119.7
M 27	072.9	723.8	597.8	126.0
M 28	088.2	737.2	597.3	139.9
M 29	098.3	754.0	596.8	157.2
M 30	106.8	770.6	596.3	174.2
M 31	098.0	762.1	595.8	166.3
M 32	084.4	749.1	595.8	153.3

Station	g (mgal)	g _o (mgal)	r _o (mgal)	△g _o (mgal)
M 33	982 089.5	982 750.9	982 594.8	156.0
M 34	116.3	765.3	594.3	171.0
M 35	117.7	758.0	593.4	164.7
M 36	105.0	744.1	592.9	151.2
M 37	098.7	736.3	592.4	143.9
M 38	102.5	734.8	592.4	142.4
M 39	095.1	719.1	592.4	126.7
M 40	085.3	707.1	592.4	114.7
M 41	083.0	708.2	592.4	115.8
M 42	091.4	718.4	592.4	126.1
M 43	097.8	724.3	591.9	132.4
M 44	109.6	753.0	591.9	161.1
M 45	118.8	741.2	591.9	149.3
M 46	127.6	744.5	591.9	152.6
M 47	133.5	740.6	591.9	148.7
M 48	142.6	740.4	591.9	148.5
M 49	152.4	739.1	591.9	147.2
M 50	154.0	738.2	591.9	146.3
M 51	154.1	730.0	592.4	137.6
M 52	153.6	716.8	592.4	124.4
M 53	192.6	755.8	592.9	162.9
M 54	216.5	767.9	592.6	175.4
M 55	183.3	733.9	592.4	141.5
M 56	158.6	707.9	592.4	115.5
M 57	168.1	712.8	592.4	120.4
M 58	157.3	697.7	591.9	105.8
M 59	151.3	685.5	592.4	93.1
M 60	143.7	679.7	591.9	87.8
M 61	141.7	678.4	591.9	86.5