

## Additional Gravity Observations in The Faroe Islands

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In a recent paper (Saxov, 1969) a detailed report is given concerning gravimetric measurements including the definition of the basic values of the main gravity stations in Tórshavn. Three anomaly maps giving Free Air anomalies, Bouguer anomalies, and Bouguer anomalies including terrain effect, were also presented. By inspection of the maps it was found worthwhile to make a denser net of gravity in different areas, first of all in Mykines-Vágar, secondly in the southern part of Streymoy, and thirdly in Sandoy. In connection with other geophysical work a visit was paid to the islands in June—July, 1970. Worden Master gravimeter No. 779 was employed and in Fig. 1 the drift curves for the auxillary stations Tórshavn 6 and Sørvágur A are given.

The gravimeter shows a negative drift rate for the first day (which was exactly the same in the 1967 measurements), however, for the remaining time of the period the drift is almost linear and of the order of 0.01 mGal per hour. The corresponding figure in 1967 was 0.02 mGal per hour. In this connection attention must be drawn to the fact that the gravimeter was sent for repair in 1968 and a detailed study of the drift values for the years 1967 to 1970 has revealed an hourly drift value of about 0.02 mGal in 1967 and 1968, and about 0.01 mGal for 1969 and 1970 (*Lind and Saxov, in preparation*).

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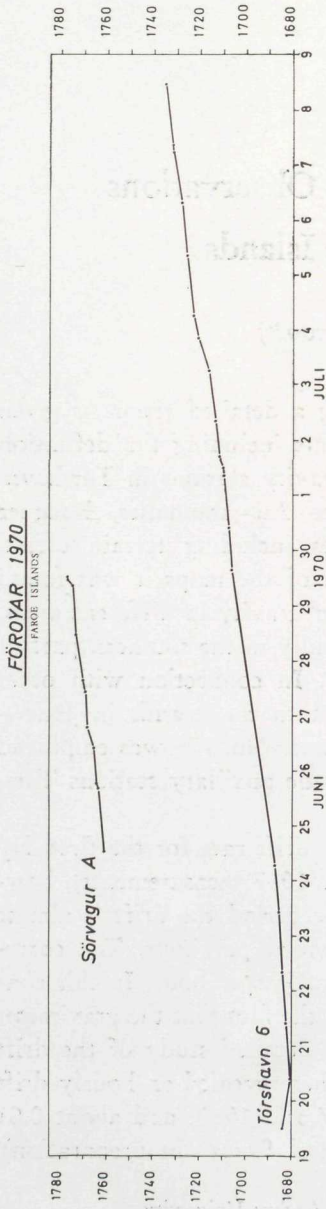


Fig. 1. Drift curves for Worden Master gravimeter No. 779.

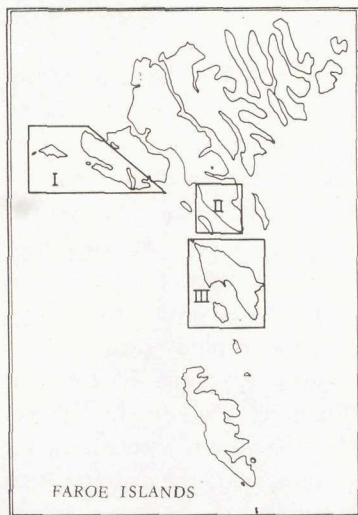


Fig. 2. Key map.

It must be emphasized that no tidal corrections have been applied in either case.

Three previous stations were remeasured giving the following results

Vaagø 1 (Miðvágur)	982.10459 Gal against 982.10457 Gal,
Vaagø 10 (Sørvágur)	982.10363 Gal against 982.10365 Gal, and
Sandø 13 (Skopun)	982.10136 Gal against 982.10135 Gal.

These results are agreeing very well. While Vágur 1 and Vágur 10 were based in previous years on WM 779 measurements Sandoy 13 is based on 1964 measurements with the application of W 142.

It was intended to carry out gravity observations along all the old cairn footpaths (tracks) at Vágur. Due to bad weather conditions only a small part of the work planned came into operation. On the other hand it was found preferable to visit Mykines, while only one station existed there. As a certain part of the time had to be spent in Tórshavn it was possible to carry through the Sandoy programme and establish additio-

nal stations in the Tórshavn area. In Fig. 2 the actual areas are indicated.

The gravimetric observations have been reduced in the usual manner. The geographical coordinates have been computed from the topographic maps in the scale of 1:20 000. The elevations of the stations are given in metres. A density value of 2.67 g/cm<sup>3</sup> has been employed. Theoretical gravity has been taken from the tables published by *Andersen* (1956). Terrain corrections are computed according to *Hammer* (1939) and *Bible* (1962). In the time-consuming computation of topographic corrections topographic maps in the scale of 1:20 000 and 1:100 000, besides sea-charts of the Faroish Sea in the scale of 1:100 000, have been used. The computations have been carried out for the zones A to M. In the following table we have given the number of the gravity stations, the numbering following the previous lists, the geographical coordinates, the elevations in metres, measured gravity referred to Tórshavn 1 = 982.10833 Gal (based on Buddinge G = 981.55800 Gal), Free Air anomaly, ordinary Bouguer anomaly, and Bouguer anomaly including topographic correction, the anomalies expressed in mGal.

In the table is included Vágar 8. The geographical coordinates and the deviation have been changed as a mistake was made during the 1964 season.

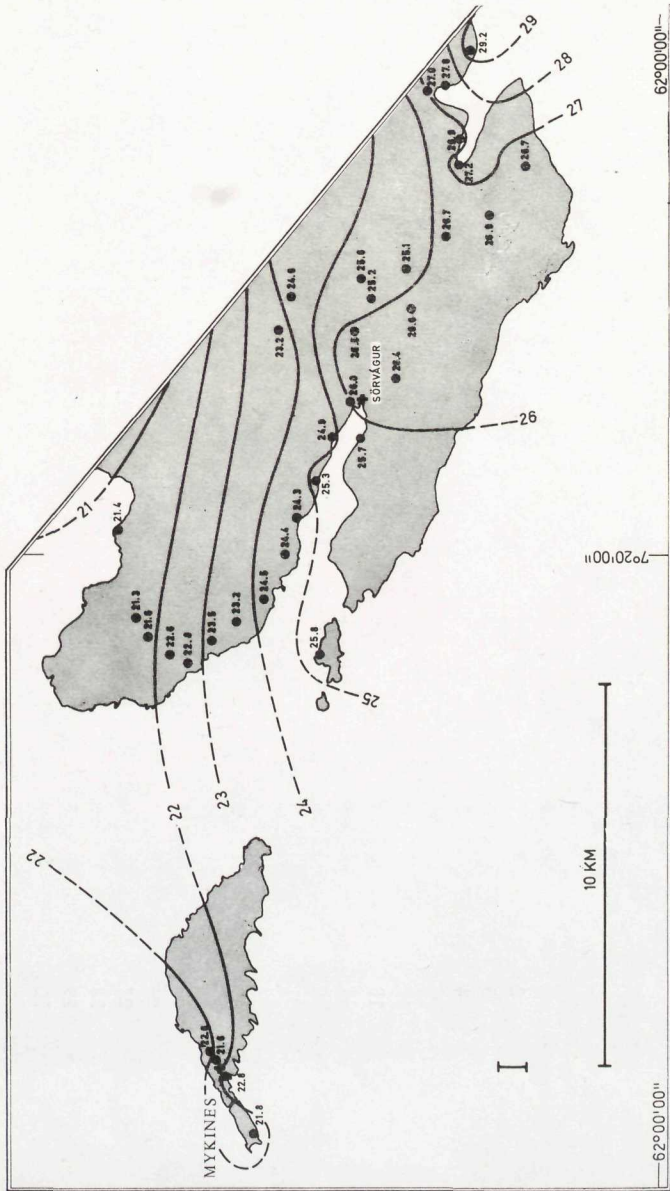


Fig. 3. Bouguer anomaly including topographic correction in Mykines—Vágur (area I).

Station	Longitude W of Grw.	Latitude	Elevation in metres	Obs. Gravity in Gals	Free Air anomaly in mGal	Bouguer anomaly in mGal	Bouguer anomaly incl. top. corr. in mGal
<i>Mykines</i>							
2	07°38'16"7	62°06'07"2	40	982.09856	+25.91	+21.45	+22.8
3	07 37 49.4	62 06 15.8	70	09138	27.81	19.99	21.6
4	07 37 37.1	62 06 20.4	110	08413	32.86	20.57	22.6
<i>Sundoy</i>							
17	06 48 01.1	61 50 37.1	12	09530	33.40	32.06	33.5
18	06 49 25.4	61 50 06.8	20	09311	34.32	32.09	33.5
19	06 51 21.6	61 50 11.0	60	08424	37.71	31.00	32.8
20	06 44 37.6	61 49 19.3	44	08718	36.79	31.87	33.2
21	06 44 33.4	61 48 15.8	52	08133	34.74	28.93	33.4
22	06 43 16.9	61 49 20.5	77	08084	40.60	32.00	33.4
23	06 41 18.0	61 48 50.6	57	08323	37.45	31.08	33.1
24	06 39 12.5	61 48 09.0	121	06927	44.11	30.59	34.1
25	06 39 02.3	61 47 52.5	129	06675	44.41	30.00	34.3
26	06 38 52.1	61 47 33.0	149	06060	44.84	28.20	34.1
27	06 39 15.4	61 47 20.6	168	05412	44.48	25.72	33.7
28	06 39 55.9	61 50 11.5	82	08184	42.09	32.93	34.1
29	06 40 50.3	61 50 36.5	100	07872	43.54	32.37	33.8
30	06 49 59.6	61 52 09.4	52	08916	37.68	31.87	33.7
31	06 53 28.8	61 54 00.2	112	07938	44.10	31.59	34.4



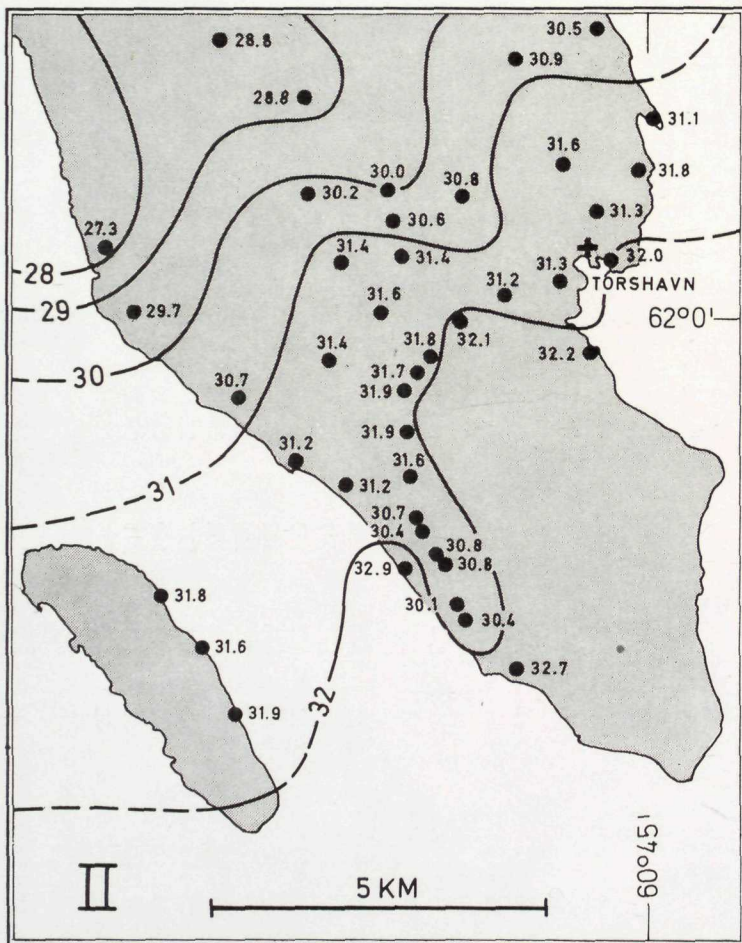


Fig. 4. Bouguer anomalies including topographic correction in southern Streymoy (area II).

Figures 3, 4, and 5 correspond to the last column's anomaly curve with an equidistance of 1 mGal being drawn. It is clearly seen in Fig. 3 that no large changes in the anomaly curves occur in Vágar. There is, however, no solution to the question whether some of the curves are pointing to Suðuroy

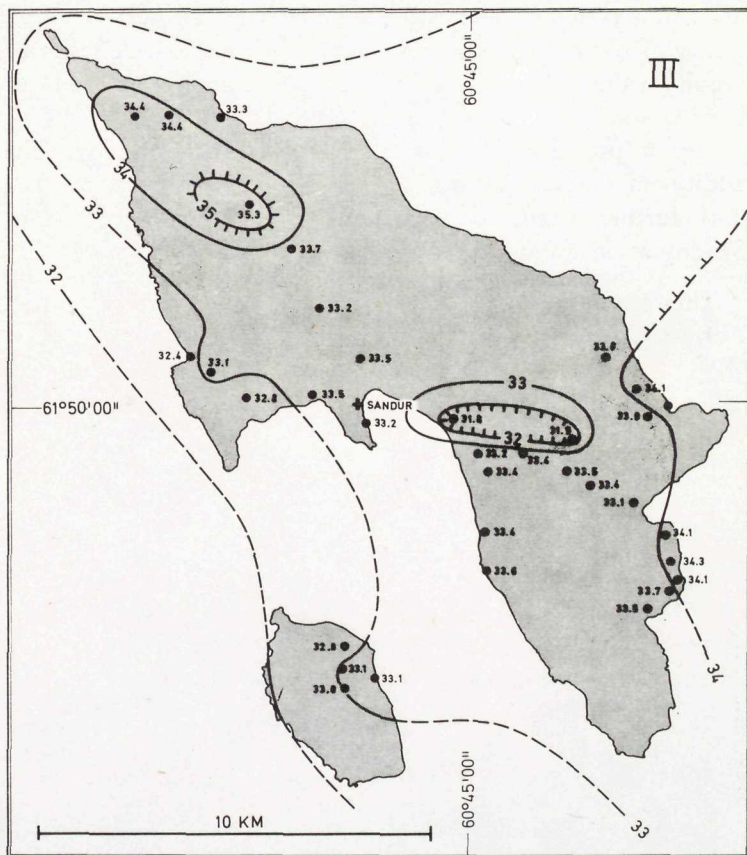


Fig. 5. Bouguer anomalies including topographic correction in Sandoy (area III).

or retreating eastwards. The measurements at Mykines did confirm that the more positive anomaly values do not enclose the Mykines island. It is very obvious that the northern part of Vágur ought to be measured and it is even necessary to extend the surveying area to the region between Vestmanna and Tjørnuvík.

From Fig. 4 it is seen that the values west of Tórshavn are very agreeable. It was surprising to locate a gravity minimum

northwest of Kirkjubøur. On the other hand a control computation of data and corrections gave confirmation. A series of gravity values along the cairn footpath from Arge to Kirkjubøur would be of interest.

Fig. 5 presents the anomaly conditions in Sandoy. The additional gravity stations confirm the previous picture. The only further measurements would be in the southern end of Sandoy at Sendalsheggjar and at Skúvoyarfjall.

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## ÚRTAK

Nakrar og 40 tyngdarstöðir voru settar í verk og eru nú meira enn 350 tyngdarstöðir tilsamans í Føroyum. Nýggju stöðirnar eru í trimum ymsum landspørtum: Mykinesi—Vágum, sunnasta partinum á Streymoyinni og á Sandoyinni. Sandoyar frávikini vátta fyrru myndina. Í Suðurstreymi varð funnið eitt minni, men greitt minstamát. Mátungarnar í Mykinesi og vestara partinum í Vágum hava í vissan mun bœtt um fráviksmyndina.

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