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EVALUATION OF THE TENSE SITUATION OF THE GEOLOGICAL ENVIRONMENT WITH THE GRAVIMETRIC STUDIES IN GOBU MASSIF

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ABSTRACT. Evaluation of geodynamic conditions and the study of the fault-block structure of the consolidated layer according to non-tidal variations of the gravitational field to carry out construction work in Gobu massif.
***Keywords**: Gobu massif, gravity force, non tidal variations, gravimetric field.*

The gravimetric investigations were carried out on a polygon dedicated to the Gobu massif that the perimeter of 15282 meters (Fig.1) .

Figure 1. Scheme of the polygon on the Gobu massif

Re-measurement according to the relief of non-tidal variations of relative gravity force in the area was carried out using GC-5 Autograph device (Fig. 2) on 12 profiles that reflect 36 observation stationS in itself.

Figure 2. CG-5 AutoGraph gravimetry

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Gravitational acceleration was released on observation (scheme 1) of its differences between two stations. This method allows to increase the accuracy of measurement and it is estimated one of the leading methods for detecting depth faults, gradient zones, displacements occurring in the internal structure of the gravity force. This creates an opportunity to estimate the geological processes occurring in deeper layers of the Earth's crust and to analyze comprehensively the direct relationship between seismic activity in the research field.

A_1----B_1----A_2----B_2----A_3----B_3----A_4----B_4----A_5

Table 1

№ s/s	Observation point	g (м qal)	midline
1	2	3	4
1	1 ----- 2	2,446	0.0328
2	2 ----- 3	4,558	0.0299
3	3 ----- 4	7,892	0.0343
4	4 ----- 5	0,7833	0.0218
5	5----- 6	10,608	0.3031
6	6-----7	0,567	0.3095
7	7-----8	3,215	0.2980
8	8----- 9	0,537	0.2562
9	9 ----- 10	5,885	0.0274
10	10 ----- 11	21,492	0.0358
11	11 ----- 12	14,942	0.0382
12	12 ----- 13	2,752	0.0394
13	13 ----- 14	0,962	0,0213
14	14 ----- 15	4,356	0,0310
15	15 ----- 16	3,453	0,0309
16	16 ----- 17	11,898	0.0301
17	17 ----- 18	20,112	0.0277
18	18 ----- 19	3,673	0.0276
19	19 ----- 20	8,683	0.3193
20	20 ----- 21	5,318	0.0324
21	21 ----- 22	0,082	0.2430
22	22 ----- 23	3,894	0.2167
23	23 ----- 24	0,134	0.3200
24	24 ----- 25	2,111	0.3014

Table 1's extension

№ s/s	Observation point	g (м qal)	midline
1	2	3	4
25	25 ----- 26	1,947	0.0318
26	26 ----- 27	10,652	0.0272
27	27 ----- 28	10,339	0.0303
28	28 ----- 29	3,737	0.0294
29	29 ----- 30	0,432	0,0316
30	30 -----31	12,361	0,0319
31	31 -----32	2,134	0,0218
32	32 -----33	3,588	0.0317
33	33----- 34	3,692	0.0334
34	34----- 35	7,87	0.0341
35	35 ----- 36	3,401	0.0329

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Scheme 1.

The main purpose of the research work is to study the fault-block structure of consolidated crust according to non-tidal variations of the gravity force for construction works in the Gobu massif and on the basis of this to evaluate the geodynamic conditions occurring during the formation of structures attracting by geophysical data complex in that area. Thus, the results of the gravitational re-measurements of the gravity force observed during the 2013-2014 period are given in Table 1.

Speaking about the changing character of gravity force variations according to time between the observation points, it means the results obtained in the research area have been described in the form of a map and three-dimensional model (Fig.3-4).

Zones, profiles, observation points and hazardous areas accompanied by Δg are precisely covered in the isoanomal map of the gravitational field (Fig. 3).

As seen from observations, the increase in the relative gravitational force between the stronghold practice point is a changeable character in the III, IV,V,VI and IX, X profiles addition to other profiles. Most of all, it is more profitable in the III and VI profiles.

It changes from 0.076 to 5.36 mGal in the I and II profiles. Gravity force variations is observed from 5,885 to 21, 492 in the 10-11 observation points in III profiles with intensive changes of gravity force , in the IV profile in 12 points, to 11,898 in the V profiles in 12 observation points, to 20,112 mGal in VI profils in the 18th point, from 0,432 to 12,361 mGal in IX profil in the 27-28th points and it is reflected incompatibility of the gravity force assessment in itself in dimensions (Fig. 3).

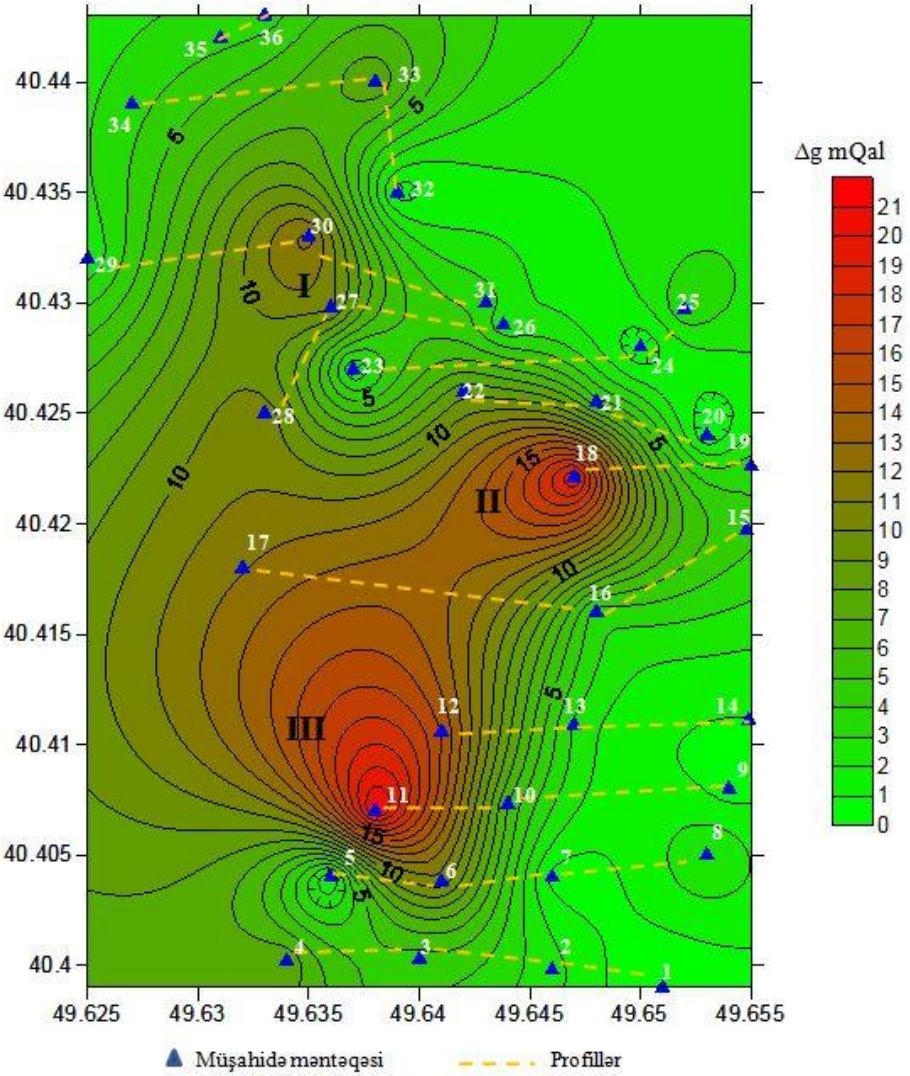

Figure 3. Isoanomal map of the gravity field at the research polygon

As can be seen from the descriptions, the studied area which will function as a living place in the future has a generally relative, calm geodynamic situation but we can not say it in different areas.

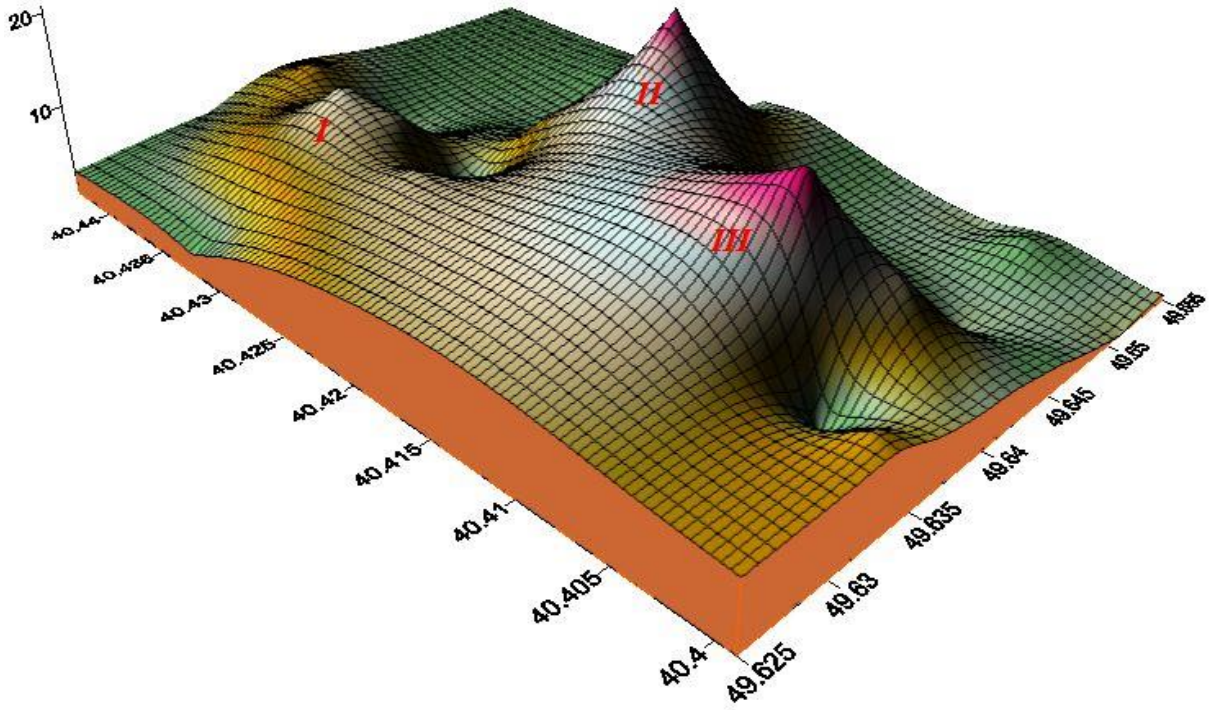

Figure 4. 3D model of the gravitational field at the research polygon

Thus, in the local anomalous areas (I, II, III areas) in the northern and southern parts, the mass of mountain rocks can create a basis for formation the cracks according to tense situation of geological environment the expense of gravitational landslide on the upper layers and the results of the repeated gravimetric measurement works confirm it. Construction of multi-storey residential buildings in the mentioned local anomalies area is unacceptable. In these areas, construction of parks for residental areas, entertainment small town for children, stadium and other objects can be built.

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