Gravity anomalies of Usu volcano, Hokkaido, north Japan

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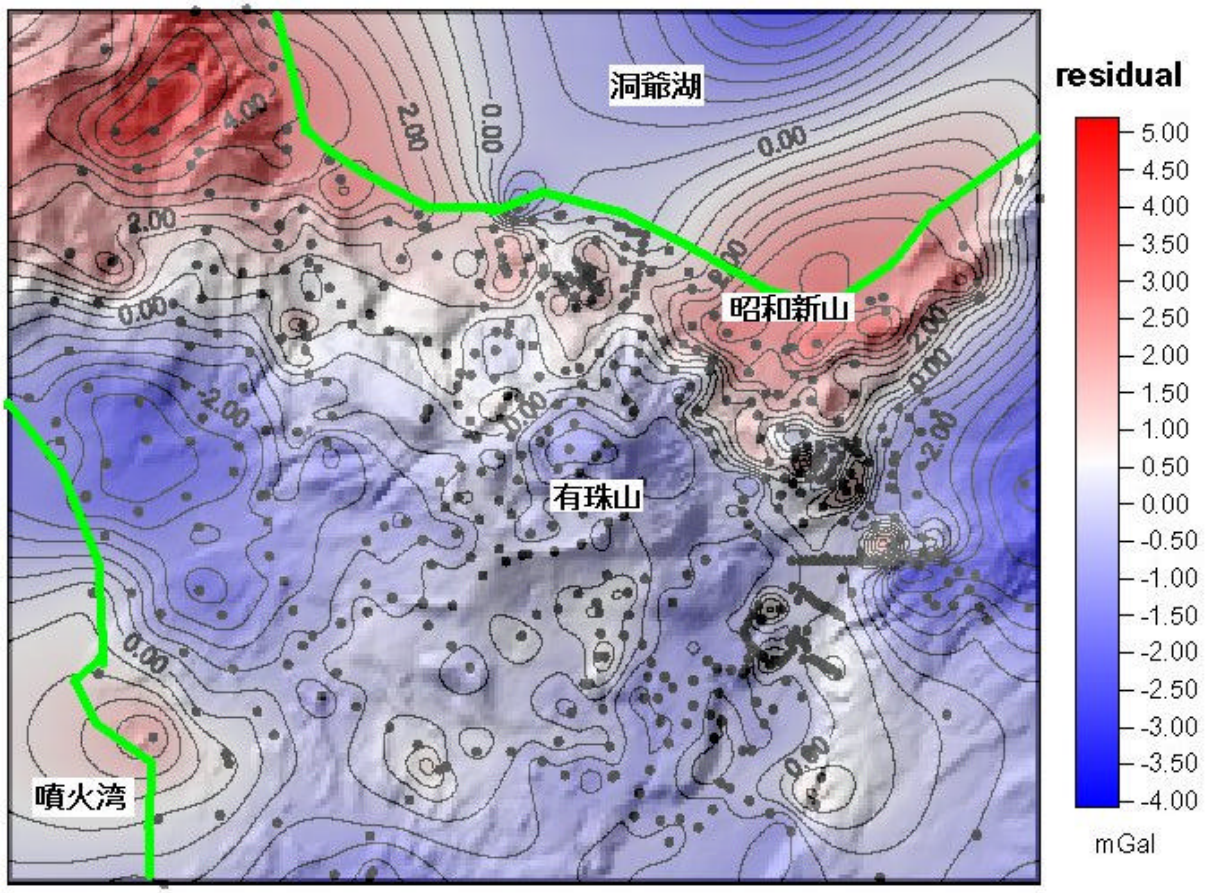
Gravity survey was carried out in the Usu volcano, Hokkaido, Japan, in 2003 and 2004. Two LaCoste gravimeters and one ZLS_Burris gravimeter were used. Altitude values are based on DGPS, so Bouguer anomalies are calculated with good accuracy. The total number of measurement points amounts to 340. The precise survey area was in Oh-Usu and Ko-Usu of a central volcanic cone and around Nishi-yama, where volcanic eruption occurred in 2000, and measurement points were distributed also over the perimeter part of the Toya lake for the purpose of brief survey. Moreover, the preexisting points around the Showa-shinzan volcano, which is a parasite volcano of the Usu volcano, were compiled with new points and the Bouguer anomalies were calculated. From comparing some kinds of Bouguer anomalies of each assumed densities, the optimal as surface density is considered to be 2.2 - 2.3 g/cm3, and the result is common about Japanese volcanos. The residuals of the Bouguer anomalies of 2.3g/cm3 shows that the high anomaly is distributed about the Showa-shinzan volcano, but there is no conspicuous feature about the Usu volcano. The reason is that the Showa-shinzan volcano is composed of large scale lava dome of dacite and forms a high-density block. But, the Usu volcano is composed of low densities rocks of large porosity, such as not only lava but pyroclasics, volcanic ashes, etc. Moreover, structure like large scale lava dome is not estimated under the Usu volcano, and it is thought that magma chamber may exist deeply and the vent which is the passage of lava is small.


洞爺湖
昭和新山
有珠山
噴火湾
4.00
2.00
0.00
-2.00
residual
5.00
4.50
4.00
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