

GRAVITY INVESTIGATION OF THE DIORITE IN THE AREA OF GEBHARTS

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The main task of detailed gravity measurements was the investigation of separated diorite bodies as known in the area of Gebharts (Waldviertel, Lower Austria). They are surrounded by other kinds of granites such as the Eisgarn and Wolfsegg types and cordierite gneisses. A net of about 150 gravity stations has been established equally distributed within an area of nearly 24 km² covering the main diorite complex near Gebharts. The station interval varies between 200 and 350 m. A separated outcrop of diorite east of Gebharts was covered by a gravity profile with 50 m station interval. An additional density investigation was performed by analyzing surface rock samples. Unfortunately representative rock samples could be gathered only at few locations, but it was possible to determine mean densities for all important rock types.

The Bouguer anomaly was computed using both constant and variable reduction density. The terrain correction of the area close to the stations was calculated based on digitization of detailed topographic maps and interpolation on a 250 m grid. Due to the interpolation algorithm the irregular distribution of the digitized points caused at several locations unacceptable differences between digitized and interpolated heights. Separation of the area into four smaller districts resulted in a remarkable reduction of the errors. Terrain corrections were calculated by numerical solution of the corresponding boundary integrals.

The Bouguer anomaly was interpolated on a 250 m grid according to the mean station interval. The residual field was separated by wavelength filtering. The best results were achieved by using a cut off wavelength of about 5 km corresponding to a maximum source depth of about 2 km. Several gravity profiles were selected in order to develop two-dimensional models for estimating the vertical extension of the main diorite body. The question whether the diorite body is a continuous source or separated in different parts will be investigated by three-dimensional modelling.