

ABSTRACT

The thesis is a part of project „Gravity model of the Karlovy Vary granite pluton“, The project is solved at the Faculty of Science, Charles University, Prague and it is supported by Grant Agency of the Czech Republic, grant 205/05/0156.

The Karlovy Vary pluton is a part of larger body, The Krušné Hory Mts. pluton, which probably occurs beneath whole area of the Krušné Hory Mts. In the western part of these mountains The Karlovy Vary pluton forms a large outcrop of the granite body. The granites are source of a remarkable regional gravity low. Granites intruded in time interval of several milion years during and after a main deformation phases of the Variscan orogenesis. With regard to age, we recognize two main types and a lot of subtypes of granites. These types are different not only in their ages but also in geochemical composition. We studied if different types of granites are distinguishable also in petrophysical properties and in geophysical measurements in the field. Chosen methods were gravimetry and magnetometry. We measured a 3500 m long profile at the locality close to the Karlovy Vary town, where three types of the granites occur: Older Intrusive Complex (OIC), Younger Intrusive Complex (YIC) and transition type of the granite – microgranite (porhyric granite). Gravity measurements were processed to the form of Bouguer anomalies, magnetic measurements were corrected for time variations and values of ΔT anomalies were calculated.

To get an idea about densities and magnetic susceptibilities we collected a set of samples in the area of survey. The results of laboratory measurements showed petrophysical homogeneity of various granites with an exception of slightly higher bulk densities of microgranites compared with OIC granites. This fact was confirmed during field measurements: the body of microgranites inside the OIC is clearly visible as a local gravity high whereas a difference in gravity field over the OIC and YIC granites was not observed. In magnetic field we could recognize all three types of granites: the quiet magnetic field values over YIC are 20 nT higher than those measured over OIC. The body of microgranites was characterized by a strongly fluctuating magnetic field. Laboratory measurements did not provide clear explanation because of the similarity in magnetic susceptibility values for all measured types. We assume that the difference between magnetic field over OIC and YIC is caused by various remanent magnetizations of both granite complexes while the fluctuating magnetic field over microgranites is due to artificial source.

Finaly a $2\frac{3}{4}D$ model were created. It seems that gravimetry relatively good bound a body of microgranite and magnetometry could define the OIC/YIC contact.