НАЦИОНАЛНА КОНФЕРЕНЦИЯ ПО ГЕОФИЗИКА
20 години Дружество на геофизиците в България
София, 17 декември 2010 г.

Анализ и обратни задачи за геомагнитното и гравитационно поле на плутона Хесперидес на остров Ливингстон, Антарктика

Петър Ставрев[1] *и Никола Кръстев*[2]

[1] Минно-геоложки университет „Св. Иван Рилски", София, stavrev@mgu.bg;
[2] Български Антарктически Институт, София, nkrastev@yahoo.com;

Ключови думи: магнитни трансформации, магнитно моделиране, обратни задачи, Хесперидес, Антарктика

Analysis and inversion of magnetic and gravity anomalies of the pluton Hesperides at Livingstone Island, Antarctica

Petar Stavrev[1] *and Nikola Krastev*[2]

Abstract. The Hesperides plutonic body outcrops SE from the Hesperides cape at Livingstone Island, near the Bulgarian Antarctic Base "St. Kliment Ohridski". This is a Lower Cretaceous intrusive body of gabbro-diorite to quartz-diorite composition and younger dyke formations among flish-like rocks of Permian and Triassic age from the Meyers Bluff formation. Magnetic measurements of the total field cover the region of Hesperides with a grid of 50x10 m. A gravity profile crosses the elongated plutonic outcrop. Magnetic data analysis shows anomalous field consisting of intensive regional field of -587 nT and local field above the plutonic body with maximum value of 962 nT. The residual local field is transformed to the vertical component *Z*, modulus of the anomalous magnetic vector *T* and vertical derivative T_z before quantitative interpretation to be applied.

The plutonic body is represented by a 2.5D model with a star-like vertical cross-section that allows a unique solution of the inverse problem to be obtained. Results from the performed optimization of the model using magnetic data along a line across the axis of Hesperides anomaly shows the plutonic body with width of 200 m and vertical size of 300 m. The length of the body is greater than 400 m. The normally oriented vector of magnetization has the value of 1.7 A/m characteristic for the middle basic to basic composition of the intrusive massives.