Review of the geomagnetic field research activities in Lithuania

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Lithuania is successfully integrated in the European geomagnetic field research activities. Six secular variation research stations were established in 1999 and precise geomagnetic field measurements were performed there in 1999, 2001, 2004, 2007 and 2016. Obtained diurnal magnetic field variations at measuring station and neighbouring observatories were analysed. All measurements are reduced to the mean of the year using data from geomagnetic observatory of Belsk. Based on the measured data the analysis of geomagnetic field parameter secular changes was performed. The Institute of Geodesy has acquired modern equipment for geomagnetic field measurements in 2012. The equipment consists of two units of antimagnetic theodolite Theo010B with D/I FLUXGATE magnetometer, dIdD magnetometer and ENVI PRO magnetometer/gradiometer.

Research of geomagnetic field parameter secular variations

There was no geomagnetic observatory in Lithuania till 2017, therefore geomagnetic field parameter secular variations were researched at secular variation research stations (repeat stations). Periodic measurements at permanent research stations are essential for research of long-term variations of geomagnetic field. In Lithuania such research is periodically performed at 6 stations of special construction.

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New geomagnetic observatory in Aukštadvaris

Geomagnetic observatory was established in Aukštadvaris in 2017 by the Institute of Geodesy, Vilnius Gediminas Technical University. The observatory is located away from larger settlements and intensive traffic roads, surrounded with the forests in the neighbouhood of VGTU practice base camp (Fig. 1).

Figure 1. Location of observatory in Aukštadvaris

The building is built of wood. Other building materials were carefully selected and checked on the influence to magnetic field. Basement of the building was made of cement reinforced with fiberglass. Area of the building 36 m^2, with a cellar of 11 m^2. Outside view of building is shown in figure 2.

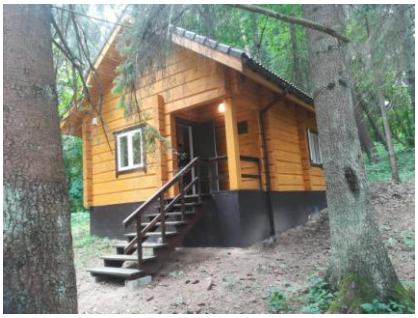

Figure 2. Outside view of observatory

Absolute observations of geomagnetic field parameters are performed with theodolite *Theo010B* with *D/I FLUXGATE* magnetometer on pillar especially established for this purpose. Sighting directions were selected outside of observatory building, Astronomic azimuth using GNSS RTK observations was determined to these directions.

Problems should to be solved

Observations in Aukštadvaris were started in July 2017. Comparison observations with neighboring Belsk observatory shows, that are problems with DidD magnetometer orientation in Aukštadvaris. It is necessary to perform detailed research related with base stability. Also problems of uninterruptable power supply and internet data streaming should be solved. We also lack experience of operating equipment, data processing and interpreting.

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