

NEW GEOMAGNETIC OBSERVATORY INSTALLATION IN CHEONGYANG BY KOREA METEOROLOGICAL ADMINISTRATION

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Recently, a Geomagnetic Observatory in Cheongyang (GOC) has been established by the Korea Meteorological Administration(KMA) to measure geomagnetic field precisely and to study the possibility of forecasting of earthquake activity. The GOC consisted of 4 huts is located in a mountainous area and about 5 km away from the main traffic road, which will reduce the artificial magnetic noise. The total magnetic field strength on the site including the magnetic field by rocks and soils was measured by using a mobile gradient Cs optical pumping magnetometer(G-858, Geometrics) equipped with a GPS receiver to find an ideal site for the GOC. The vertical gradient of the geomagnetic field around the 3-axial fluxgate sensor hut and the Overhauser sensor hut for the GOC was measured.

In addition, the magnetic properties of all the materials used for the GOC such as sands, marble, gravels and brass were controlled to avoid the improper use of ferromagnetic components.

The equipments of the GOC are a 3-axis fluxgate magnetometer (DMI), an Overhauser effect proton magnetometer (GEM), and a data logger (MinGeo). A D/I magnetometer is prepared for the absolute measurement. The Cs-He optical pumping magnetometer was used to correct the measured data by the proton magnetometer for absolute measurement of the geomagnetic field more accurately [1]. Furthermore, the magnetic standard system was used for calibration of all the measurement equipment used [2]. The test measurement results indicate that the measurement conditions meet the INTERMAG requirements. Therefore, we will participate in the INTERMAG and share our geomagnetic field data with the other national geomagnetic observatories.

[1] V. Ya. Shifrin, V. N. khorev, V. N. Kalabin, P. G. Park, "Experimental estimation of the accuracy of modern scalar quantum magnetometers in measurements of the Earth's magnetic field", Phys. Ear. Plan. Inter. 166(2), pp.147-152(2008).

[2] P. G. Park, Y. G. Kim, V. Ya. Shifrin, and V. N. Khorev, "Precise standard system for low dc magnetic field reproduction", Rev. Sci. Instrum., 73(8), pp.3107-3111(2002).

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