Geophysical Research Abstracts,
Vol. 10, EGU2008-A-00114, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-00114
EGU General Assembly 2008

The new INTERMAGNET 1-second standard fluxgate magnetometer

V. Korepanov (1), A. Marusenkov (1); J. Rasson (2), S. Leonov (1); A. Prystai (1)

(1) Lviv Centre of Institute of Space Research, Lviv, Ukraine (vakor@isr.lviv.ua/+380-322-639163); (2) Institut Royal Meteorologique, Dourbes, Belgium (jr@oma.be/+32-60-395423)

INTERMAGNET is a network of geomagnetic observatories covering practically all the globe. This network is collecting 1-minute data of three components of Earth magnetic field values and its module, both with resolution 1 nT, and transmitting them to several global INTERMAGNET nodes (GIN). New requirements of scientific research and multiple practical applications need more frequent sampling and higher resolution - 0.1 nT - what can not provide the magnetometers existing in the majority of geomagnetic observatories. The necessity to create new observatory 1-second magnetometer relevant to INTERMAGNET standard motivated corresponding development at Lviv Centre of Institute of Space Research (Ukraine) with participation and support of Dourbes Geomagnetic Observatory (Belgium). The peculiarities of a candidate INTERMAGNET compatible 1-second fluxgate magnetometer design were considered and analyzed. The present report includes the tests results and first experience of operation with the final version of the new instrument. The key parameters of the magnetometer are following: Ţ low time shift of acquired data (<1 ms); Ţ excellent resolution (< 1pT); Ţ low noise level (< 4 pT/Hz-1/2); Ţ deep suppression of the power mains interference (> 120 dB); Ţ autonomous operation with recording data to the flash card (about 30 days). The instrument produces 10 Hz data, centered to the top of the 0.1 second of every second. These data comes to PC, where the control program calculates 1-second data using digital Gaussian filter. The filtered values are centred to the center of the second. A next Gaussian filter produces from 1-second values 1-minute values, centred at the top of the minute. 1-second and 1-minute data

are stored in separate files in accordance with IAGA-2002 format. The test results showed that this instrument may be useful for wide geophysical applications, where high quality magnetic measurements are required. In the report a special attention is paid to the detailed description of the magnetic data acquisition algorithm and experimental confirmation of the specified synchronization accuracy. These works were partially supported by INTAS project 05-1000008-8050.