

1-SECOND INTERMAGNET STANDARD MAGNETOMETER – 1-YEAR OPERATION

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At Dourbes OPSCOM/EXCOM meeting in 2003, a decision was made to launch a new standard for recording variometric data within INTERMAGNET with a sampling rate of 1 Hertz. This new 1-second standard requires a specialized magnetometer for its implementation as it was stated in [1]. Such a magnetometer was developed in Lviv Centre of Institute for Space Research with the support of Dourbes Geomagnetic Observatory (Belgium) and Central Institute for Meteorology and Geodynamics (Austria) and its first prototype was tested in Dourbes. Several issues are considered here basing on these test results. First, the requirement as to the magnetometer measurement resolution given in [2] was corrected: 1 pT instead of 10 pT was confirmed to be more suitable in order to decrease the digitizing error [3]. Second, it was stated that, due to the fact that 1-second samples fall within so called “dead band” (0.1-1 Hz) where the level of natural variations is minimal, the sensitivity threshold of 1-second magnetometer has to be much lower as this of 1-minute one. The recommended value was below 5 pT, as close to 1 pT as possible. And third, the damping of higher frequency noise, especially of power line harmonics was to be much greater. For the moment, only Dourbes and Conrad Geomagnetic Observatories have specialized 1-second instrument, but 1-second data are produced by several observatories using former equipment. The goal of this paper is to analyze 1-second data taken from the magnetometers of former and new designs in order to understand the advantages of a new version and to estimate the losses of information which occur. The obtained results are discussed. This study is supported by the contracts with Dourbes and Conrad Geomagnetic Observatories.

- [1] V. Korepanov, A. Marusenkov; J. Rasson. A candidate for a new INTERMAGNET standard 1-second variometer: key features and tests results. XIIIth IAGA Geomagnetic Observatory Workshop. Conference Program and Abstracts. Boulder and Golden, Colorado, USA, June 9 – 18, 2008, p. 26.
- [2] J. J. Love. 1-Second Operational Standard for INTERMAGNET. Minutes of the OPSCOM/EXCOM INTERMAGNET meeting. Mexico, 2005.
- [3] J. Rasson. TITLE. Minutes of the OPSCOM/EXCOM INTERMAGNET meeting. Dourbes, 2008.

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