

EXPERIENCES WITH NEW OBSERVATORY PRACTICES MONITORING THE ORTHOGONALITY AND ORIENTATION OF THE DIDD

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Since the beginning of this decade fast DIDD magnetometers have been also applied to record the geomagnetic variation as an “INTERMAGNET standard” instrument. The principle of this instrument makes it clear, that the values recorded by DIDD are void from offset and scalar factor errors. For the description of the reference frame only four parameters are needed: The angle between the two magnetic axes of the coil system (ϵ_{ID}) and the three orientation angles (I_0 , D_0 and ϵ_0). Two methods were developed in the past to find and monitor the coordinate system of the DIDD by using independent geomagnetic measurements. The first method uses absolute measurements to calibrate the DIDD (Schott and Pankratz 2001) while the other is the inter-calibration process developed in Tihany Geophysical Observatory (Heilig 2007). The second method is based on simultaneous recordings of a DIDD and a tri-axial fluxgate magnetometer.

A simple new procedure is applied in order to measure ϵ_{ID} value directly from DIDD recordings themselves. The sensitivity of this calculation is at the order of arc seconds at the geomagnetic latitude of Tihany Geophysical Observatory. The advantage of this method is double. First, we will be able to adjust the orthogonality accurately, and on the other hand we can monitor the value of this angle periodically. The cognition of this angle is an important station in the development of DIDD instrument, because it gives the possibility for self-calibration of the orthogonality. After the orthogonality error is eliminated only the three orientation angles including the levelling of the D axis (ϵ_0) left to be determined. This can be done using absolute measurements.

The poster will describe the new methods and present the first test results to demonstrate the accuracy and the limitation of the new observatory practices.

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