

Levelling error corrections to D-measurements in DI-flux magnetometers

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A b s t r a c t: Absolute measurements are essential to obtain base values of standard variometers. The accuracy of the final magnetic values of an observatory depends on these values. DI-flux magnetometers become the standard instruments for measuring D and I components. In a DI-flux magnetometer, D-measurements results depend on several instrumental factors, namely: electronic offset and collimation, which could be automatically compensated using the method of the four positions and computing D as the mean of the four reduced observations. However, D-measurements results depend also on an accurate levelling of the fluxgate sensor. Therefore an error may occur if the theodolite is poorly levelled and horizontal levelling of the sensor is not carefully set while measuring. In principle this error is not compensated in the direct calculation from the mean of the four positions and can be hidden in the results. Nevertheless, it is possible to compensate this levelling error by computing it from I-measurements and correcting it in the D values lately. This paper describes the procedure to test and correct this levelling error in D-measurements.

Key words: absolute measurements, DI-flux magnetometer, levelling error

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