Geosci. Instrum. Method. Data Syst. Discuss.,
doi:10.5194/gi-2017-20-RC1, 2017

Geoscientific Instrumentation Methods and Data Systems Discussions
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EGU

Interactive comment on "Few years' experience with Automatic DIFlux systems: theory, validation and results" *by* Antoine Poncelet et al.

L. Hegymegi (Referee)

hegymegi@mingeo.com

Received and published: 2 May 2017

Absolute observations in geomagnetic observatories is one of the most important issue since a long time. The presently used method needs experienced operator and it is time consuming. This fact is even more substantial in case of remote stations or hardly accessible places during a certain part of the year. An automatic instrument which helps to overcome on this problem is very important for the observatory community. I strongly support the publication of this article after some additions and corrections.

Chapter 2. Equations (11) and (12) used for declination and inclination angle calculations are correct but in the deduction are some missing things and mistakes (see supplement).

Chapter 3.1 The validation method described here supposes that the magnetometer is

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Discussion paper

linear in the applied range. Did you tested it?

Usually bubble levels are sensitive to temperature changes. What is your experience in connection with this? You should give some measurement evidence on this problem which can give some information on the environmental requirements of the MKII.3

Chapter 3.2 Your angle reading validation based on ISO 17123 standard. This material is not an open access publication and not known usually for the observatory people. You should give a bit more information about the validation and calculation procedure.

Chapter 3.3 Generally a small size, low-cost laser has not a homogeneous beam. Did you tested how this fact can influence the precision of the azimuth direction determination? Another important question what is the effect of the changing weather conditions on the direction measurement stability? Did you had any long-term test with fixed laser and target pair?

Figure 5. (and not Figure 4. as it is in Chapter 4.2) Exhibits good stability for the baselines in a long period however there are some scatters and deviations in shorter periods (not in the period of contact problems). What was the reason for that? Why the D baseline measured by MKII in most cases is above the baseline measured by manual method?

Chapter 4.3 On Figure 7. Is the red solid line the adopted baseline calculated from manual measurements? What is the dimension of vertical axis?

In Chapter 4.4 the Figure 8. is a good example to show how important is the mutual stability of the instrument pillar (or the instrument itself) and the azimuth mark. This problem is more important when the distance between the instrument and the mirror is smaller. In the paper there is no information about the optimal distance in case of which the reflected laser beam is enough for the differential sensor and the mutual movements of MKII and the laser reflector can be neglected.

What is the reason of the drift at the end of the measurement period? What P1...P7

means?

Chapter 5. What is the reason that from the conclusion is missing that MKII is suitable to run an unmanned observatory? Do you think that this goal was not yet reached?

The paper contains several typing and language errors which does not disturb to understand the article but they should be corrected. For instance the instrument is called sometimes AutoDIF mk2.2 or MarkII Automatic DIFlux etc. IAGA code of Conrad observatory is WIC Name of the relevant ISO standard is ISO 17123 There are cited articles in the main text (line 24) which were not listed in the Reference list etc.

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