Geosci. Instrum. Method. Data Syst. Discuss., 2, C103–C104, 2012
www.geosci-instrum-method-data-syst-discuss.net/2/C103/2012/

Geoscientific Instrumentation Methods and Data Systems
Discussions

Interactive comment on "Solving the orientation problem for an automatic magnetic observatory" *by* A. Khokhlov et al.

J. Rasson (Referee)

jean.rasson@meteo.be

Received and published: 13 August 2012

General comments The paper proposes the automation of a magnetic observatory by simply extending the time interval between absolute measurements up to several years. Given absolute measurements are until now the only tasks performed by an operator, automatic operation would be obtained during those long timespans. Note that in present observatories, time between absolute measurements are of a few days only. The extension from a few days to several years is claimed to have no notable detrimental effect on the absolute data collection because the magnetic variometer, whose baseline is monitored by the absolute measurements, is of adequate quality: the calibration of this variometer in terms of scale values and orthogonalities do not introduce errors worse than 0.1 nT. Stability of those parameters over time are suitable

too. The paper adresses a specific question about how the errors made during the sparse absolute measurements will impact the orientation errors of the variometer and its measurements in presence of secular variation. An encouraging result is obtained for the specific variometer envisioned for the task, using simulations modelled from absolute measurements performed in real world observatories.

Specific comments The paper is excellent and should be published. It gives a precise answer to the question: How long are my once baseline corrected data valid, given ideal instrument and installation? However, the title "Solving the orientation problem..." is a bit misleading as the paper only adresses a specific aspect of the problem. Indeed, the very authors mention it when telling they do not adress the all important problem of pier motion and strain. Maybe the authors should add "Contribution to..." to the title. A problem that we can expect from data collected in the way the authors explain would be that the errors on the data will fluctuate with the same frequency as the sparse absolutes. The errors would probably describe something like a sawtooth over time. I believe some data processing on the raw data would be necessary to smooth this out. Certainly we can expect more low frequency noise entering the data than for frequent absolutes.

Detailed comments On p 350, line 2, it would be good to mention that the Vector Field Magnetometer embarked on SWARM is not the one discussed in this paper. A better reference to our work on automatic absolute measurements would be: Rasson J.L., and Gonsette A, 2011. The Mark II Automatic DIFlux, Data Science Journal Vol. 10, pp 169-173 https://www.jstage.jst.go.jp/article/dsj/10/0/10_IAGA-24/_pdf ISSN:1683-1470

Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss., 2, 337, 2012.