

Referee Report: First results from the equatorial geomagnetic station at Entoto Observatory and Research Center by A Nel et al.

Summary:

This paper presents the initial results from the newly deployed Entoto Magnetometer Station near Addis Ababa, Ethiopia, a collaborative project involving the South African National Space Agency (SANSA), the Space Science and Geospatial Institute (SSGI) in Ethiopia, and the German Centre for Geosciences (GFZ).

General Comment:

This is a well-written manuscript that can be recommended for publication after some re-writing has been done to address certain questions and concerns.

Specific Comments and Questions

1. The 'Entoto Observatory' can at best be called a 'Variometer Station' because it does not qualify as a magnetic observatory in the true sense of the word as no absolute measurements are being done to determine baseline values. In the manuscript the authors use both 'station' and 'observatory' which can confuse the reader of this paper.
2. In line 7 the authors write 'ENTOTO', while in the manuscript title it is written as 'Entoto'. Consistency is advised.
3. Figure 1 reveals that substantial magnetic gradients exist at the site of the station, reaching 240 nT/m in the North-West corner. The effect of this is that the area is not clean as a 10nT/m gradient is normally the criterium for a clean site. It is recommended that the position of the station be shown in Figure 1 to give the reader a better appreciation of its location. These large gradients, indicative of magnetised rocks under the surface, can unfortunately lead to substantial induction effects on the magnetic field recordings, leading to larger than expected errors in the data. The authors should comment accordingly in the rewritten paper.
4. In line 102 the authors mention the Keetmanshoop INTERMAGNET observatory. Please provide a reference. (Korte, M., M. Manda, H.-J. Linthe, A. Hemshorn, P. Kotzé and E. Ricaldi : New geomagnetic field observations in the South Atlantic Anomaly region. *Annals of Geophysics*, 52, 65-81, 2009.)
5. In line 106 the authors briefly mention the use of venting pipes for temperature stability. It is well-known that fluxgate magnetometers are extremely sensitive to temperature variations. Are venting pipes adequate to provide the required temperature stability? It would be informative for the reader to add a temperature variation plot to show that the environment inside the box is stable enough for the fluxgate sensor.
6. What about lightning protection? The authors do not mention it in the paper, and is it of any concern?
7. The authors mention that data are sampled at 1 min intervals using 1 sec values. How is this determined? Using an average over 60 sec, centred at the middle of each

minute interval, or is it done by taking the average 30sec before and 30 sec after the minute? Please explain.

8. Line 330: Please provide a website if no journal reference is available.