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Interactive comment on "Stability analysis of geomagnetic baseline data obtained at Cheongyang observatory in Korea" *by* Shakirah M. Amran et al.

Anonymous Referee #2

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The paper discusses the instabilities observed in baselines of Cheongyang observatory for a period of two years. The authors have analyzed the cause for the shifts and the cyclical pattern observed in the baseline. The shifts were found to be caused due to the installation of LED lamp in the Absolute room. The authors ascribe the cyclical pattern observed in the baseline to the temperature affect on the fluxgate variometer and the problem was corrected to a large extent by introducing a temperature correction. The problem of baseline instability discussed in the paper is encountered in many observatories and is of interest to the magnetic observatory community.

The paper can be further improved by giving more explanation on the following points and suggestions.

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Discussion paper

1) A scatter plot of temperature versus baseline for each component can be included in the paper.

2) In Figure 7, for Z component for the year 2016, the temperature varies from 5°C to 25°C approximately whereas the Z component base line for the corresponding period varies from 39913 to 39927 nT approximately. This gives a temperature coefficient of 0.7 nT/ °C.

Similarly for H component in the same Figure 7 during the period Jul 2015 to Dec 2016, when the temperature range was 20°C, the corresponding H baseline varied from 30250 nT to 30262 nT. This gives a temperature coefficient of 0.6 nT/ °C.

As per the FGE fluxgate manual, the temperature coefficient of sensor is less than 0.3 nT/°C. The value of 0.7 nT/ °C (for Z) and 0.6 nT/ °C (for H) observed Cheongyang observatory is far higher than the temp. coefficients specifications normally observed. This along with a complete absence of temperature sensitivity on the D Sensor is intriguing.

The baseline of H and Z appears to become more sensitive to temperature over time as seen from the same Figure 7. The authors may explain how they took care of this issue of varying sensitivity in the temperature correction applied and also explain how they arrived at a temp. coefficient estimate of 0.3 nT / °C .

3) Please check whether the temperature effect observed in the baseline is due to temperature affecting the absolute instruments in absolute room.

1) Please ensure that all entries in the bibliography are mentioned in the text.

2) Typo errors may be corrected.

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