

## ***Interactive comment on “An automatic DI-flux at the Livingston Island Geomagnetic Observatory, Antarctica: requirements and lessons learnt” by Santiago Marsal et al.***

**Santiago Marsal et al.**

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Response to reviewer #1

Find below the original reviewer's comments followed by our answers. I have also attached a modified version of the manuscript as a .pdf supplement, according to the reviewer's comments:

I suggest to improve figures 3, 4, 5b by adding axes on the upper and right side of the plot and generally to make them appear more aesthetic.

Done

C1

There are two shortcomings, and (minor) revision of the article would be an excellent opportunity to address them: Despite the title, we learn very little about the actual observations in Antarctica and any lessons learned there. Please be more informative about the current state of the instrument in Antarctica and possibly include additional data on the performance that was collected since the article was first submitted. Information on the current state of the instrument has been updated. Secondly, the list of references looks rather short. However, some concepts that are presented in the manuscript might have been used by observatory operations before and it might be valuable to mention where such concepts have been used before, or to cite relevant literature and/or review articles.

We have added more literature.

Declination should be written as declination, not with capital D.

Done

Title learnt -> learned (LEARNT IS OK, BUT LEARNED would be correct both in British and American English).

Done

p.1 l. 9 magnetometer bar -> magnetometer

Done

l. 12 practically removed -> ?

We don't understand what the problem is with this sentence. The original sentence reads "practically reduced", not "practically removed" as the reviewer seems to suggest. In case our original sentence was wrong in English, we have replaced it with "practically restricted".

l. 15 due to its simpler necessary -> due to the simpler infrastructure that is necessary

C2

Done

l. 21 current society -> modern society

Done

l. 23 augmentation of the -> improvement of

Done

l. 26 UNCLEAR: do you mean these things have been automated or should be automated?

They should.

l. 28 learnt -> learned (IF YOU WANT)

We have changed it.

p. 2 l. 5 RECORDS OF WHAT?

Magnetic field records. This has been added in the manuscript.

l. 6 measuring -> magnetic

Done

l. 13 do not rely on a -> are not fixed to a

Done

l. 28 rate-gyroscope -> ???

Yes, this is correct. These gyroscopes measure rate of change of an angle, rather than a direction. We have added two references.

l. 30 custom electronic -> custom-made electronic

Done

C3

l. 31 govern -> control

Done

p. 3 l. 1 leading to -> from the

Done

l. 7 between the above -> either

Done

l. 21 70 W. -> 70 W for the GyroDIF.

Done

l. 23 path -> line of sight

Done

l. 29 entailed -> impose

Done

l. 4 l. 2 target -> desired

Done

l. 6 the gyroscope -> the number of gyroscope

Done

l. 10 no -> the absence of

Done

l. 12 preserving in the system batteries in prevention of -> in order to overcome

Done

l. 13 generation. -> generation by means of batteries.

C4

We have removed the part mentioning the batteries, since it may lead to confusion.

l. 18 QUESTION: When you write masonry blocks, what do you specifically mean? Which type, what are they made of? Are they non-magnetic?

We have added some clarification on this a few lines below in the text. No special condition applies to these blocks except non-magnetic properties. We just seek thermal momentum, implying a material with a high specific heat capacity. Solid stones of the type typically used in masonry are suitable because they are dense and easily stackable, thus resulting in a high overall heat capacity.

l. 23 QUESTION: foam glass, which type, is it non-magnetic?

Foam glass is a light insulating material made of glass and air bubbles also used in masonry. You can find more information on the particular mark we have used in <http://www.foamglas.com/>. Yes, it must be (and indeed it is) non-magnetic (we have specified it in the text).

p. 5 l. 12 winter -> local winter OR austral winter (PLEASE USE THIS ALWAYS WHEN YOU MENTION SUMMER OR WINTER)

Done. We have added "local" or "austral" in most occurrences of "winter" and "summer" when they were necessary.

l. 14 use to -> usually

Done

p. 6 l. 30 CAN YOU RECOMMEND A FILTER?

A moving average over a time window of 10 min is enough for our purposes. This has been added in the text.

p. 7 l. 16 the opposite is left to the natural cooling -> but cooling is passive.

Done

C5

l. 18 WHY DO YOU CALL THIS BASELINE? IN MY VIEW, BASELINES ARE OFFSETS (THAT ARE SOMETIMES OBTAINED BY FILTERING MEASUREMENTS). HERE, THE MEASUREMENTS ARE FILTERED; BUT THIS DOES NOT LEAD TO A BASELINE IN THE CLASSICAL SENSE.

That's right. We have changed the text accordingly. However, we have kept the comparison with the baselines to note the resemblance of the filtering part.

p. 8 l. 3 I WOULD COMPARE THE 3 nT ACCURACY WITH THE ACCURACY THAT IS NECESSARY FOR GETTING USEFUL SECULAR VARIATION DATA, AND NOT WITH THE 5 nT STANDARD BY INTERMAGNET.

We think that comparing our expected accuracy with the INTERMAGNET standard is meaningful and worth because it is a reference for most geomagnetic observatories, but we have added a comparison with the accuracy necessary for secular variation studies, as suggested by the reviewer.

p. 9 l. 14 perdurable -> ?

Sorry, this is a Spanish/Catalan reminiscence. We have replaced it with durable.

l. 14 generators from -> generators at

Done

l. 26 system, which is duplicated -> control system, which is redundant

Done

l. 28 passage of current through -> distribution of current to

Done

p. 10 l. 3 next -> 2017????

Done

C6

Table 1 Comparative table -> Tale comparing

Done

Figure 4 box around formula for T (you call it inset)

Done

Figure 5b What is the set point used here?

55 °C. It has been added in the caption.

Please also note the supplement to this comment:

<http://www.geosci-instrum-method-data-syst-discuss.net/gi-2017-22/gi-2017-22-AC1-supplement.pdf>

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Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss., doi:10.5194/gi-2017-22, 2017.