

## ***Interactive comment on “Background noise estimation of geomagnetic signal” by Xiuyi Yao et al.***

**Xiuyi Yao et al.**

xiuyiyao@126.com

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Dear reviewer Thank you for the time and effort that you have put into reviewing the previous version of the manuscript. Your suggestions have enabled us to improve our work. Based on the instructions provided in your review report, our point-by-point response to the comments raised by the reviewer was made.

1. As the title of manuscript showed, the purpose of our paper is to make a preliminary estimation on background of geomagnetic signal. Because some seismic electromagnetic studies showed that geomagnetic anomaly associated with earthquake was small, some of that were almost same as the estimated noise level. So, we wanted to make an approximate estimation of geomagnetic background noise, and provided a

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reference for other researches.

2. We agree with reviewer's standpoint that elimination of background noise from every signal, including geomagnetic variations, is possible only if the spectra of these processes are different very much. And we also believe that when the geomagnetic variations with noise are approximated by a set of Fourier harmonics, the noise entering the signal band is also automatically approximated. Therefore, we chose the calculation example carefully. We have checked the geomagnetic data of Z component on 29 May 2013 at LYH observatory, and no short period variation (pulsations etc.) with period less than 540s was contained, therefore, we chose data on 29 May 2013 as one calculation example. We think our estimated result is correct, and the test process has confirmed that.

3. The spectrum analysis was only as a supplementary to further confirmed that our estimated result was correct. As the reviewer pointed out that a correct mathematical analysis and a convincing statistical base are needed for further increasing the signal to-noise ratio.

Please also note the supplement to this comment:

<https://www.geosci-instrum-method-data-syst-discuss.net/gi-2018-3/gi-2018-3-AC2-supplement.pdf>

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Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss.,  
<https://doi.org/10.5194/gi-2018-3>, 2018.

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