

## ***Interactive comment on “Factors controlling the geochemical composition of Limnopolar lake sediments (Byers Peninsula, South Shetland Island, Livingston Island, Antarctica) during the last ~ 1600 years” by A. Martínez Cortizas et al.***

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The article mainly presents the composition and sources of the sediments using a short sediment core from Limnopolar Lake. However, both long and short cores (eight) from the same site have been well studied by Toro et al (2013). It has provided many informations about the chronostratigraphy, mineralogy and elemental chemical composition, magnetic susceptibility and tephra layers of the lake. So the authors of this paper should be carefully to avoid the repetitive work what Toro et al (2013) has done. To my understanding, climate change and volcano eruption controlled the composition of the

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sediments. However, the text is mostly about the composition and sources of the sediments. How did the sediment composition vary with climate change and volcano eruption should be further discussed. Considering each element separately: 1. Abstract Page 3, Line 24~25, “Chromium is the only metal showing a steady enrichment. . . .as recent anthropogenic contamination”. This opinion can not be supported by this paper just as authors write in the “Conclusions” that they do not have an explanation of why it is the only element showing this enrichment and more research is needed (Page 18, line 23~24). 2. Sediment sampling (page 6~7) The core was sectioned into 0.2cm slices for the upper 10cm and 0.5cm from 10 to 57cm. So there are 144 samples in total. However, only 57 samples were analyzed. What is the criterion of the selection of these 57 samples? 3. Page 10, line 21~25; Page25, Table 1 What is the confidence level of the correlation analysis? 4. It is mentioned in the paper that Cr, unlike other elements, increased obviously in the upper 10cm. However, this abnormal phenomenon is not discussed. I think that at least comparison with other lakes in the same region should be taken. Furthermore, Enrichment Factor and Geoaccumulation Index are also good for discussing whether Cr is polluted or not. 5. Figure 1 is the same with that in Toro et al (2013). The authors do not give reference.

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