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Interactive comment on "Age depth-model for the past 630 ka in Lake Ohrid (Macedonia/Albania) based on cyclostratigraphic analysis of downhole gamma ray data" *by* H. Baumgarten et al.

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Thank you for your comment. We have tried other fits (e.g. exponential) as well and best results were gained by the linear relationship. We agree, that the R^2 of 0,6 for the linear solution is rather low. It suggests, that the relationship between the synthetic deltaO18 (calculated from gamma ray) and the original data set (deltaO18) is not completely linear. We suggest the following reasons of the GR signature:

1) Climate dependent supply and deposition of K-rich clastics (feldspars, clays). They are increased during cold-dry periods (high GR) and decreased during warm-wet periods (high carbonate deposition; low GR) in the sediments.

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2) Tephra layers that are partly recognizable in the GR / K data (increased GR). Even if the prominent layers at 20 and 68 mblf could be removed, at least 6 additional tephra layers (see tephra pointers; Fig. 2b) were identified in the cores down to 240 mblf. These thin layers (thickness < 10 cm) are not recognizable easily in the GR data and could not be removed but are assumed to contribute to the GR / K curve. Their occurrence in zones A and C (Fig. 2c; zones of decreased synthetic deltaO18) supports that they have an effect on the GR signature.

3) Variations in the catchment area. Outcrops of Triassic carbonates and clastics occur in large parts in Lake Ohrid's catchment area. Furthermore, ophiolites, magmatic and metamorphic rocks are exposed and are potential sources of terrestrial material. Erosion and transport of these rocks, e.g. by means of surface runoff into the lake, was likely variable over time and subsequently the input of K-bearing particles.

Therefore, the GR is most likely controlled by several factors and cannot be described in total by linear solution. However, the main component seems to be a linear response of K-rich sediments to the global climate trend (1). Further, we consider the attempt useful to compare both datasets and to show the very unusual similarity in cyclic characteristic between LR04 and GR.

If you agree, we will add this part to the discussion section.

Interactive comment on Biogeosciences Discuss., 12, 7671, 2015.