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Interactive comment on “Environmental changes on the Balkans recorded in the sediments from lakes Prespa and Ohrid” by B. Wagner et al.

Anonymous Referee #2

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This paper presents a few new proxies from Lake Prespa covering \sim 50 kyr and they are compared to earlier published data of lake Ohrid. Today the lakes are hydrologically connected through karst aquifers and the authors were aiming for testing/evidencing connections in the past. The discussion is focussing on rather well-dated lithological changes occurring coeval in both archives. Pleistocene short - lived lithological changes are related to Heinrich events and in Holocene to the 8.2 ky event - an interpretation which has already been proposed based on vegetation changes (see Wagner et al., 2009). Changes in proxy records (e.g., TOC) are mainly attributed to different eutrophication regimes in the two lakes. Yet the paper is rather descriptive and the interpretation contains often short statement (partly previously published) not supported by other facts and discussed properly. I think the paper could be considerably improved if the data would be embedded into a more conceptual discussion of (hydrologic, diage-

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netic) (i) processes relevant to these limnic archives and (ii) climate records (including other proxies from lakes in the nearest vicinity) from other (Mediterranean) climate archives. The paper needs a through rewriting as problems often arise due to unclear wording. Curtailments of some chapters would make it easier for readers (taking into account that there are several papers published or in press on this matter (e.g., Wagner et al., 2008, 2009; Sulpicio et al. 2010 in prep., Biogeosciences Discuss.; Vogel et al. 2010 a, b, c) (see page 3383/4) A few more specific comments below: - p3366 line 12-14: TOC contents (bioproduction vs. preservation): elaborate more explicite in your discussion how you infer on past changes of primary production / eutrophication (today TOC wt % quite similar 1, 2 wt% respect. in Ohrid and Prespa: Holocene climate optimum 1:4) (further information needed?) - p3391 Fig.6: it would be quite nice to have a close-up for the time window 0- ca. 16 kyrs. This could help to make the discussion of Holocene changes/comparison (including other data; e.g. pollen from A.Lotter) more specific. but age range could be limited to 50 kyrs, the TIC record in Ohrid is not so exciting, but if needed rather include it in Fig.7 - p 3392 Fig.7 : mechanisms for an increased detritic input (Zr/Ti, sand size fraction) during the Holocene climatic optimum (aeolian activity is higher) and during the coolings assigned to Heinrich events are different: elaborate a little bit on this statement.... (Fig. 7 and p 3376 line 21-23) at some stage in Wagner et al 2009 the authors mention (refering to the vegetation) "....The observed changes, however, cannot be related clearly to a change in temperature or humidity... " Why ist the diagenetic regime (as documented by relative Mn increase) disturbed during the glacial intervals but also during the late Holocene? Is there a reason for offsets in age assignments between Prespa and Ohrid? Some minor comments: - p3366 line 10: explain why you conclude from comparison of results (which show similar trends; see Fig.6) that Lake Prespa is more sensitive to environmental changes - p3385 the age of KIA36356 needs some attention - p 3386 useful for readers if core numbers show up in figures - p 3387 omit - p 3388 why did you select the $>20 \mu\text{m}$ (vol. %) grain size fraction? Is there a reason that I did not find a discussion of the grain size analyses data but just a statement on the sand size fraction. Did I

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overlook it? - p 3389 merge Fig.4 with Fig 3

BGD

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