

Interactive
Comment

Interactive comment on “Evolution of ancient Lake Ohrid: a tectonic perspective” by N. Hoffmann et al.

N. Hoffmann et al.

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We would like to thank the reviewers for the helpful comments and replies on our manuscript. According to your comments, we revised the manuscript. Improvements have been made as follows:

Corrections regarding spelling, figures, etc. have been included, proposed references were added where applicable. The internal structure of the manuscript was corrected to avoid loops and repetitions without changing the content.

Authors comment to RC C2201 “anonymous referee #1, 05 Aug 2010

1. “I think that authors need to separate their data from the literature. It is not always clear, which is their contribution.” The internal structure of the manuscript was

C2684

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Discussion Paper



corrected to avoid loops and repetitions without changing the content.

2. "They refer to slickenslides in the conclusions and the text but no data is actually shown." Fault slip data have been evaluated and published in another paper submitted to ZDGG, which is currently under review.

3. "Reporting fault lengths and seismic sources or an assessment on maximum expected magnitude would be a significant contribution for seismic hazard assessment." The data on fault lengths, seismic sources and maximum expected magnitudes have been included.

4. "No subduction process is taking place at present day. No oceanic crust (Tethyan remnant) is subducting at present day below the Adriatic foreland. This has to be mentioned and commented not only in the text but maybe also in Figure 1. There are thrusts but no subduction (maybe change symbols, to show the Hellenic subduction zone from Crete to Kephallonia Transfer fault, where it ends, no active subduction occurs north of the Kephallonia transfer fault)." The subduction situation north of Kephallonia has been worked out more properly. Figure 1 has not been changed as it only shows the thrusts and gives no information about subduction activity.

5. "Authors mention in Section 4 line 10 that from Pliocene to Present, E-W extension prevails resulting in a general uplift with local subsidence (Aliaj, 2000). Herein, something is missing or I disagree with the reference comment. Extension cannot result in a general uplift. When an area is extending the mean altitude is getting lower, unless some other process is operating too that causes uplift and has to be mentioned." Sentence has been deleted.

Your secondary points have also been included in the manuscript, as they improve it for a better understanding.

- "In the abstract (line 10) authors refer to three major deformation phases that lead to the basin formation. . ." Of course only the last deformation cycle led to basin formation.

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7, C2684–C2688, 2010

Interactive
Comment

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Discussion Paper



- "Authors mention (abstract line 15) that seismic hazard is among the highest in the Balkan Peninsula. I do not fully agree." Seismic hazard is among the highest only for FYROM and Albania.

- "The focal depth of the earthquake was at 2km (Section 2.1 line 18). Not sure I believe it, this focal depth is probably due to insufficient data caused by the sparse (not dense) seismic network, better erase it." Due to the scarce stations in the area the depth report might be insufficient although depths of the same range are reported from different institutions. But we can be sure that it was a shallow event causing normal faulting.

- Section 4 line 10 you may add that activity may have shifted to the lower major fault following a progressive hangingwall directed migration within the fault zone (Stewart and Hancock, 1994). 2 references were included (Reicherter et al., subm.; Stewart and Hancock, 1994).

- "Page 4652 line 2. are definitely the youngest (but why? You have to show the evidence: this is one of the most important outcomes and you have the data to support it)." See point 2.

Authors comment to RC C2242 "anonymous referee #2, 09 Aug 2010

"If the whole area is affected by uplifting, we cannot talk about subsidence indifferent places, but about different rate of uplifting in different places to be accompanied by extension. The beginning of the extensional regime can be placed in Late Miocene to Early Pliocene (supported by the data of Muceku et al., 2008). Before that compression led to uplift.

"The present situation of the roll back or slab retreat and slab break off also presented in the figure 3 don't explain very well the altitude increasing through the time and the boundary between compressional and extensional regime presented in the figure. Maybe you need to modify this figure." The situation of the subduction slab has been

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Interactive Discussion

Discussion Paper



explained better in the text now. Therefore, figure 3 remains unchanged.

“Maybe you have to put the orientation in the photos. Concerning the Figure 6B, I think that the limestones were moved down and you have to change the sense of movement (you have just to check).” Orientation was included in the photos, labeling of figure 6B was changed according to your suggestions.

1. to 3.: “The previous works concerning the Ohrid area to be taken in consideration are: (Tagari et al., 1993; Kiliyas, et al., 2001; Muceku et al., 2006 and 2008” Proposed literature was included where possible.

Minor specific comments:

2) “Section 2, line 19: “During Palaeozoic, a regional foliation developed in the Cambrian and Devonian units ... etc.” Are you sure that we have only Palaeozoic deformation?” Maybe you should have put a reference.

3) Added reference Dumurdzanov et al., 2005.

4) Section 2, line 13: “Burchfiel (2006) reports recent slip-rates of not more than 2 mm/a with a very high uncertainty due to imprecise GPS data”. Who is the sense of movement?” Slip-rates were measured on NNW striking normal faults and associated strike slip faults with right-lateral displacement (Burchfiel et al., 2006).

5) Section 3, last break: “I am not sure that Ohrid - Korca region area had the highest seismic hazard in Albania, maybe you have to check that to be sure.” changed to high seismic risk for FYROM and Albania.

6) Section 3, line 6: “In what time has been taken place the thrusting of Korabi zone over the Jurassic Ophiolites?” Eastward emplacement of the Mirdita ophiolites on the Korabi units. Robertson & Shallo 2000, Tectonophysics 316, S.201: Early-Mid Tertiary. Thrusting direction was corrected, as backthrusting e.g. in the region of Kukes can be observed.

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7, C2684–C2688, 2010

Interactive
Comment

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Interactive Discussion

Discussion Paper

7) Section 3, line 9: “I think that the thrusting is registered later than Palaeozoic also.” Alpine-Dinaride-Albanide thrusting occurred in Tertiary.

8) Section 3.2, line 20: Included references of Hoeck et al. 2002 and Bebieen et al., 1998 on ophiolites.

Additionally: References for stratigraphic position of the units were included The remark about diapirism was deleted, as all cases of potential diapirism with local references are located more to the south. In this case the relation to diapirism is not clear at all and a melange style inclusion while thrusting seems more probable but not proved yet. Therefore a more precise wording was selected. Genesis of the ophiolites was modified as the models regarding their origin are due to new findings and interpretations under strong discussion. Therefore, a more precise description including roughly the main discussion points and models was included. New references regarding ophiolites have been added.

Interactive comment on Biogeosciences Discuss., 7, 4641, 2010.

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7, C2684–C2688, 2010

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