

## Interactive Comment

# ***Interactive comment on “Detailed insight into Arctic climatic variability during MIS 11 at Lake El’gygytgyn, NE Russia” by H. Vogel et al.***

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General comments There are not so many detailed records on MIS 11, a still mythic interglacial period. The MIS 11 record of lake El'gygytgyn ((Chukchi: Элгыгытгын)) provides an important set of data with information related to environmental changes of a remote continental place of the Arctic.

A previous paper (Melles et al., *Science*, 2012) presented an impressive 2.8 million year record of arctic climate change from the El'gygytgyn core revealing a set of “super interglacials”, and based on the analysis of several proxies discussed in particular the strong “interglacial intensity” of MIS 11c (but also) MIS31 in comparison with MIS 1 and MIS 5e. The results were discussed in terms of forcing and feedbacks. The present manuscript is based on more and higher resolution multiproxy data in order

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to provide a detailed insight into arctic climatic and environmental variability during the MIS12/11 transition and MIS 11 at lake El'gygytgyn. From figure 4, the basic climatic data (MTWM and PANN) have not been improved since Melles et al.

An important part of the paper is devoted to the analysis of the numerous proxies investigated in this study (methods, records, interpretation in terms of environmental indicators). I am not myself an expert in lake sediments record (I am more expert on ice cores, that generally contains proxies of a different nature), but fortunately referee # 1 makes a detailed assessment and recommendations on the multiproxy record presented in the paper.

Melles et al. interpreted a first MIS11 climatic record from El'gygytgyn and compared it with MIS 1 and MIS5. The main MIS 11 findings and interpretations presented in the Melles paper should be summarized in the introduction of the Vogel et al. paper in order to highlight the added value of the new data. For instance, what is the added value of the new data when addressing the comparison with the Baikal record or supporting the teleconnection between southern and northern high latitudes as one of the main feedback leading to a super interglacial MIS 11 in the Arctic?

Chronologies and age models. This is a critical issue when comparing the E'lggytgyn record with other paleorecords, and even more in the case of a relatively short period like the MIS12/MIS11 transition and MIS11 duration. This is for instance important when looking at Figures 3 or 4 and I strongly suggest to highlight in the figure caption the fact that the respective chronologies used make a direct correlation of the observed events rather speculative. If I am not mistaken, the paper give only temporal resolution for the composite core but I did not find indications of dating uncertainties (p. 6314, lines 15 to 22). This is a required information. The paper in section 5 compares the El'gygytgyn record with other records in a global context. The different age models used can be critical when discussing MIS 11 issues. Is that discussed somewhere a part from saying in the conclusion that correlation of specific swings is hampered because of the large errors of the different age models?

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Duration of MIS 11. This is a complex question, which, for instance, is currently debated in a PAGES group devoted to the Past Interglacials. Apart from the chronological uncertainties mentioned above, the major difficulty is likely to assess when an interglacial period starts and ends. In the case of the multiproxy approach used at lake El'gygytgyn, the problem is maybe even worse depending of the proxy we consider. Nevertheless I agree that at El'gygytgyn, like in some (a few?) other globally distributed sites, MIS 11 has a long duration compared to the following (younger) interglacials. Is the duration 27 or 25 or 30, that's another problem and I don't think we can be more precise at this stage of the knowledge and taking into account the different uncertainties.

Following the reviewer #1, I will recommend to reduce the speculative interpretations either because of the significance of the proxies (but again it's not my expertise) or because of the uncertainties linked with the age models. At least evaluation of uncertainties should be provided.

In summary, the submitted paper by Vogel et al. provides a unique high-resolution set of multiproxy data with information related to environmental changes of a remote continental place of the Arctic, and we should be grateful to the authors for that. Because of the lack of such data covering the MIS 11 interglacial it is essential to have such data published and available for the paleo-community. Should the paper to be published, it should, before to be accepted, highlight the new results and interpretations since the Science paper of Melles et al.(2012), assess more thoroughly the uncertainties of the different chronologies that make the correlations between different events observed in other globally distributed climatic records speculative, and reduce a branch of speculative interpretations.

A very few and certainly not exhaustive specific line-by-line remarks, which should be completed on a future revised version.

P. 6311, line 23: we should avoid to use the word "analogue", but you can speak of "orbital analogue". P. 6311, lines 25-27. Are you really convinced about what is said by

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this sentence? At least replace “will” by “could”

CPD

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