

## ***Interactive comment on “Were last glacial climate events simultaneous between Greenland and western Europe?” by M. Blaauw et al.***

**M. Blaauw et al.**

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We thank the referees and editor for their thoughtful reviews of our manuscript. They have helped to improve the manuscript, especially by placing it into a wider context. Below we will reply to the comments of the referees.

One take-home message of our manuscript is that research of past climate could be enhanced by quantifying the uncertainties involved (e.g., in tuning). If our uncertainties are of millennial scale, we can not answer centennial scale questions.

Both Maria Sánchez Goñi and Chronis Tzedakis detail the rationale of “tuning” in palaeoclimate research, and we have now included a discussion of tuning in our manuscript. Examples of tuning have been added, and limitations of the method are pointed out (see sections 2 and 5).

Both referees question whether Les Echets is the proper archive to test for the timing between Greenland and European glacial climate events. To assess the timing of D-O events between archives, we used Les Echets as a recent high-resolution dated and analysed terrestrial proxy archive. Although some dates show a considerable scatter, the dating resolution is still higher than in most other terrestrial or marine archives, and they are not prone to an imprecisely known and possibly varying reservoir effect such as is the case for marine dates. The present analysis can be seen as a proof-of-concept, and we will include more archives (marine and terrestrial) in a future study.

Replies to specific comments of Chronis Tzedakis:

We are aware that the Cariaco dataset is based on tuning, and have pointed this out in our manuscript.

We have included more details of the age-modelling process in the methods and following sections.

Reply to specific comment of Maria Sánchez Goñi:

Using a Bayesian approach to data with quantified uncertainties, it is an easy task to quantify leads and lags (e.g., with our windows approach, the probability can be calculated that an event took place within 200 years after another event in another archive). We believe however that this is beyond the topic of the present manuscript.

The editor suggests we discuss the Les Echets proxies in more detail. Some details have been added, but the reader is referred to Wohlfarth et al. 2008 and other related recent literature for a more thorough discussion. We also added a comparison of our proxies with nearby studies in section 4.

We thank Chronis Tzedakis, Maria Sánchez Goñi and Valerie Masson-Delmotte again for their constructive comments on the manuscript, and hope that with the applied changes it has now become suitable for publication in *Climate of the Past*.

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Interactive comment on *Clim. Past Discuss.*, 4, 1203, 2008.

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