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Climate of the Past Discussions

Interactive comment on "Climate fluctuations during the Holocene in NW Iberia: high and low latitude linkages" *by* L. D. Pena et al.

Anonymous Referee #2

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Review of the paper : " Climate fluctuations during the Holocene in NW Iberia :high and low latitude linkage " by L. D. Pena et al.

This paper presents new oxygen isotopic and salinity data from the NW Iberian margin. Such data are always useful, however the discussion and conclusions of the paper are not directly supported by these isotopic data and radiocarbon ages of the record. Thus I would suggest to reject the paper. Following are the main reasons and more detailed comments.

Interpretation of the isotopic records:

The authors suggest that the relative influence of two North Atlantic water masses, Eastern North Atlantic Central Waters either of subpolar either of subtropical origin,

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are responsible for the variations along the Holocene of the carbon and oxygen isotopic composition of benthic foraminifera that lived at 38 m depth, in the Ria de Muros.

Concerning the carbon isotopic variations the author assume they reflect the different water mass influence through in situ production of organic matter or export of this organic matter to the continental shelve. In the first part of the record the authors explain the decrease of the carbon isotope values as a direct consequence of the increasing sea level and the involved increased in situ production of organic matter. However they do not present the variation of the percentage of organic matter along the core. There are no sedimentological information for the core. There is no data about organic matter of continental origin, that could represent a significant percentage of the organic matter within the core, and could fluctuate with continental climate. The isotopic composition of the organic matter should be measured along the core and compared to the foraminifera isotopic composition for the authors to support their interpretation of the foraminifera carbon isotopic record.

Concerning the oxygen isotopic foraminifera record, the authors interpret the increase at the beginning of the record (from approx. 8200 to 7600 yrsBP), as the result of the increasing sea level. It would be nice to have a comparison between the water isotopic composition within the Ria de Muros, compared to the composition of the Eastern North Atlantic Central waters to learn about the modern influence, within the Ria, of the continental runoff. The authors explain the sharp decrease, at around 4 kyrs BP of the oxygen isotopic composition as an increase influence of the fresher and colder ENACWsp. However there is no oxygen isotopic signal at the end of the corresponding carbon isotope excursion, at around 3 kyrs BP. Other possible influences on the oxygen isotopic record composition within the Ria should be discussed.

"North Atlantic climate links":

This part of the discussion is based on the comparison between the Ria de Muros record with two records, one from the North Atlantic, one of tropical origin. This part

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of the discussion is based on the radiocarbon chronology of the different records. But the authors prefer to compare the records making some "wiggle matching" arguing that "inaccuracies in the radiocarbon age model of core EUGC-3B could not enable to asses the synchronicity of events". They is no discussion about the inaccuracies in the age model. It is true that the earlier part of the EUGC-3B record has only two radiocarbon dates (at 7.6 and 4.8 kyrs BP) but the authors choose to distort the age by around 0.75 kyrs even around this second radiocarbon age (event 3). If the age scale is as worse as the authors propose, it would be interesting to consider the wavelet study using a somehow corrected age scale. The conclusion that "cold episodes are likely triggered at high latitudes and then rapidly propagated towards lower latitudes" cannot be supported with such age scale problems.

Some minor remark/questions: What do the authors mean by "rapid aging of the upwelled ENACW" on line 24 of page 1286? On page 1287, line 8, no units should be anymore used for salinity. Page 1288, line 15, could the author precise what is the disaggregating solution and how long is the sample bathed in such a solution. Page 1290, line 14, the mean 13C value at the beginning of the record is closer to -0.7 than -0.3 per mil Line 26 "rapid increasing trend to more positive values" should be written.

Figures: Fig 1.f is to small. the police size of axes should be bigger on a number of figures.

Interactive comment on Clim. Past Discuss., 3, 1283, 2007.