

## ***Interactive comment on “Influence of the North Atlantic subpolar gyre circulation on the 4.2 ka BP event” by B. Jalali et al.***

**Anonymous Referee #5**

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Review of *“Influence of the North Atlantic subpolar gyre circulation on the 4.2 ka BP event”* by Bassem Jalali, Marie-Alexandrine Sicre, Julien Azuara, Violaine Pellichero and Nathalie Combourieu-Nebout for CoP

This paper is a bold effort to investigate the state of the North Atlantic SPG during the so called 4.2 event and the effect seen in climate archives in the Euro- Mediterranean region. It presents some new and also previously published paleoclimatic data from a number of archives from mostly marine setting. It is a special focus on two North Atlantic records of alkenone derived SST with relative high time resolution and a pollen record from the Gulf of Lyon. The paper is written in the context of an increased understanding of (mostly from modelling) the role SPG plays in the climate system and its possible relationship with the strength of the AMOC. The paper is well written, the

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theme is central for a journal like CoP, and the paper shows a sound scientific rationale, therefore I will strongly support a publication of the paper. However, there are some points/suggestions I would like the authors to consider in a revision of the manuscript.

1. Short pollen record presented; how is the 4.2 event sticking out in terms of vegetational changes through the Holocene. How unique are the presented changes in vegetation in the Gulf of Lion region. Add some information with references. 2. Chronology. A central part of the paper is the timing of the changes seen in the marine record. For the core north of Iceland previous age model (papers by Eiriksson, Knudsen and others) have by the use of combined radiocarbon and tephra studies estimated  $\Delta R$  in the order of 100 to 200 years and partly developed age models accommodating this. The authors should explain how they have handled this in the paper and also give an assessment of the influence of possible variability in the  $\Delta R$  can have on the comparing of terrestrial and marine sites.

Line 90 . . .collected as part of the international. . .

Line 121 Could have been nice to see this illustrated with a cross correlation analyses

Line 146 Reword from Ionita (2016) something like . . .demonstrated that atmospheric blocking over Greenland could result in more freshwater flow from the arctic through increased flux of sea ice and possibly result in features like the GSAs. . .

Line 180-185 This needs to be better explained. Hatun (2005) suggested an increased Nordic sea inflow of water with higher temperature and salinity both in the east and west during periods with a weak SPG in the late 20th century.

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