

***Interactive comment on* “Uniform climate development between the subtropical and subpolar Northeast Atlantic across marine isotope stage 11” by J. P. Helmke et al.**

Anonymous Referee #2

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Helmke et al. discuss climatic events surrounding the transition from glacial Marine Isotope Stage (MIS) 12 to interglacial MIS 11 as well as the duration of MIS 11 based on data generated from the subtropical eastern Atlantic (ODP Site 958). They then compare the data to published climate records from the subpolar northeast Atlantic (M23414) and discuss similarities and differences between the low and high latitude Atlantic. For this purpose the proxy records from both sites are reported with respect to the SPECMAP chronology.

General Comments:

This is an interesting contribution to the issues surrounding MIS 11. To my knowledge,

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the manuscript is scientifically sound, the data are of high quality, and the temporal resolution of the proxy records (1-2 kyr) is appropriate for the type of conclusions drawn.

I have a few comments that may help the authors in revising their manuscript. I would consider these to be relatively minor changes mostly to improve the clarity of the manuscript.

I suggest reorganizing the text into Results and Discussion. As currently written, section 3 and 4 both contain descriptive as well as interpretive elements and it is not clear to me how the text fits under the respective headings. The description of termination V would fit better into the context of development than climate systematics? Once all records are described, then the discussion could be broken cleanly into subheadings to separate regional elements such as sapropels, trade winds, and surface oceanography versus the larger spatial comparison (meridional temperature gradient).

In detail:

Abstract: line 15: I am not sure that connectivity is a word that is widely used. It seems awkward. I would suggest replacing it with link or connection.

Introduction: page 435, sentence beginning on line 13: This sentence is really confusing. I would not go as far as saying that the above cited studies suggested a strict comparability; between MIS 11 and the Holocene. I also suggest replacing opposed with questioned. Lastly, specificity is a not word that is widely used. I would suggest revising this sentence. I think the authors mean to say something along the lines of: These latter studies question the analogy between the climate conditions of MIS11 and the Holocene and suggest that among interglacial intervals, the meridional temperature gradient..can be different.

Section 3:

I suggest restructuring this section to first describe the Cibicidoides d18O record because it presents the overall evolution of the climate. Then against this backdrop,

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describe the other records. For example as written right now, the last sentence of this section does not make any sense. The so-called prominent benthic d18O change is simply the global cooling and ice volume increase, is it not? This d18O record follows SPECMAP. So it is not really prominent, it just suggests that the Site 958 benthic d18O record follows the global stack. I would think that it is the planktics that are different and that this is the interesting point?

Page 437: line 22: What criteria define the full interglacial interval? For example, the minimum benthic and planktic d18O values could be given in parenthesis? I would also suggest adding the age range here (e.g., 396-420 ka). Finally, how does this definition of peak warmth compare to the interval of peak warmth defined by Oppo et al., 1998?

Page 438, line 8: regarding the carbonate content: I would reword this sentence by leaving out rapidly and replacing with with by to indicate that the carbonate content increases and reaches 90

Page 438, line 20: Careful with the word significant, it implies statistical meaning.

Page 438, line 21: Replace rapidly changing with more specific terms such as increasing d18O values toward MIS10.

Section 4:

Page 439, line 5: I am confused regarding the description of termination V and how it extends into the interglacial. In my understanding, the data belong either to the termination or the interglacial interval, but I do not see how the termination can extend into the interglacial? I think that it would be better to simply describe these results providing ages and d18O values, or rates of change in the d18O values.

Further in the paragraph (line 10, page 439) the authors refer to along lasting glacial to interglacial transition, this is much clearer.

Page 442, line 13: the d18O values of the forams do not reflect salinity per se. They reflect the d18O of seawater, which is linked to evaporation versus evaporation patterns,

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and therefore salinity. I think it is important to make this distinction.

Page 442, between lines 24 And 25: I think this would be a good place for a subheading that indicates that the text will now focus on the low to high latitude comparison.

P 443 line 13: The sentence about rising SSTs in the northeast Atlantic when d18O values were still decreasing is confusing? It reads as if the authors are trying to point out an opposing pattern, while the two proxies (rising SST and decreasing d18O) would agree?

Page 443: The paragraph beginning at the bottom of page 443 is very confusing. The first sentence addresses maximum warm conditions within MIS 11, but the second sentence then goes on to talk about the end of MIS 11 and the decline of interglacial conditions. Line 18 of this paragraph, it is not so clear exactly what new data are presented in this study that would support that MIS11 is different from the Holocene. I assume that this statement is based on the interpretation of the Fe count data and the timing of the implied wet period with respect to the insolation curve. This point is made quite nicely in the summary and the conclusions. But, it was lost to me in this particular paragraph. This may be an example of how separating the Discussion into different subheading may help to highlight the importance of the study.

Page 444: Line 15: replace exponents with proponents

Figure 4: This is an important comparison between the MIS 11 and the Holocene. However, I suggest plotting the two time intervals using the same age range. As is, Figure 4A (MIS 11) spans 50 kyr while Figure 4B (Holocene) only shows 15 kyr. I do realize that MIS 11 is much longer, but the comparison made here is visually misleading. I suggest revising the figure by decreasing the length of the a-axis in Figure 4B to align it quantitatively with the x-axis in Figure 4A.

Interactive comment on Clim. Past Discuss., 4, 433, 2008.

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