

Interactive comment on “A modified seasonal cycle during MIS31 superinterglacial favors stronger ENSO variability” by F. Justino et al.

Anonymous Referee #1

Received and published: 7 January 2019

This study is an interesting work to be published in *Climate of the Past* after a moderate revision. First, I think it will be beneficial for the authors if they include “modelling study” in their title. The introduction is missing some introductory texts regarding the main message given in the title and abstract. Although I support the insightful analysis done in the manuscript, I think the authors should add few lines that why they use a certain method for their analysis and how to interpret those in terms of climate dynamics. Results in the manuscript and their implications are interesting but the main story is sometimes hidden behind. My major and minor comments regarding the text and analysis are following:

Introduction: Add few lines about the main goal of the paper and relevant previous studies

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Section 2:

Line 122: which year did you use for the present-day run?

Line 126: When you talk about the difference between MIS31 and CTR, so you mean the difference between their mean over 500 years?

Line 175: eddy SLP is confusing here. I would show SLP itself as it is easier to compare it to SST and wind field. Instead, you might show eddy Z200.

Line 201: Add the latitude to the thermocline figure. You need to highlight this paragraph better as it is part of your main story.

Line 224: cold SST anomalies could be because of the displacement of Kuroshio current. Try to make this paragraph more related to the main story.

Section 3: suggested headline: Enhance seasonality in MIS31

-You need to help the reader to understand why you did harmonic analysis. Some readers may not know how to understand and interpret the analysis in Figure 2. Please explain in two/few lines. For example the 1st harmonic represents . . . and the second one represents Why not simply plotting the annual cycle to understand the change in seasonality and what is the benefit from harmonic analysis? Also instead of showing the difference between MIS31 and CTR, show the harmonic analysis for each. To avoid showing many figures, just show the analysis for the most relevant variables. Also for the variance, show it for the seasonal case. In general stay to the point.

Section 4: Restructure part of the text. First explain the stronger ENSO at interannual time scale and possible causes behind it. Recall the results from previous sections (enhanced seasonality and shallower thermocline) to link your results to each other. Then talk about the decadal variability and why it is weaker in MIS31. Again, stay to the point.