

Interactive comment on “Thermal evolution of the western South Atlantic and the adjacent continent during Termination 1” by C. M. Chiessi et al.

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The manuscript by Chiessi and colleagues seeks to reconstruct oceanic and atmospheric thermal conditions in the southeastern South America region, as evidence for changing climate during Termination 1. In general the manuscript is well presented, well-written, and with comprehensive literature support. The finding that the marine temperature appear to be associated with AMOC strength, and that changes in the continental temperature in this region are synchronous with atmospheric CO₂, are interesting. In general, I am very much in favor of this paper which is within the scope of Climate of the Past. Before publication, however, I would like the authors to consider these 2 major points listed below.

1. My overall concern is that the results and discussion sections are brief and could
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be more informative. Chiessi et al. present a really interesting high-resolution data set of the Termination 1. However the authors discuss only the (multi-)millennial scale variability when the data show interesting multicentennial scale variability. I would like the authors to complete the results and discussion sections in term of centennial scale variability, particularly the opposite centennial trend between SST and MAT during the HS1: For example, high SST occur when minima in MAT occur at 16.5 and 15 cal ka BP. SST drop Vs MAP sharp increase at 15.5 cal ka BP. How the authors can explain this opposite thermal evolution during HS1 between the continent and the BC? In this way, I would like the author to give more details about regional ocean-atmosphere interactions at millennial and centennial time scale.

2. Following the previous studies, the slowdown of the AMOC during HS1 has been presented as responsible of the heat retention in the Southern Hemisphere. This is not strictly the case as explained by Mayewski et al., 2009. Those authors describe that changes in the Antarctic ice sheet, sea ice extent, and Antarctic Circumpolar Current (ACC) position can also affect Southern Hemisphere heat retention and ocean circulation. The Brazil-Malvinas Confluence is connected with the ACC. Several studies in Antarctic Peninsula have shown that the winter sea ice edge, cold fresh water discharged, Iceberg runoff would have driven the latitudinal position of the ACC in the South Atlantic Ocean during the Termination 1. In this way, a change in ACC position would have affected the latitudinal position of the Brazil-Malvinas Confluence and affected the SST of the BC. I suggest that the teleconnection between the high latitude and the mid-latitude should have to be taken on board during this period. I would like to ask the authors to consider their interpretations of the SST changes in light of the studies about the ACC evolution during the Termination 1. Maybe the authors could compare their results with the SST reconstruction of Bianchi et al., 2004 (EPSL) or the Icebergs discharge reconstruction of Weber et al., 2014 (Nature).