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Climate of the Past Discussions

Interactive comment on "Changes in Holocene meridional circulation and poleward Atlantic flow: the Bay of Biscay as a nodal point" *by* Yannick Mary et al.

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We are very grateful for your positive comments and interesting suggestions.

The reference to the article of Mojtahid et al., (2013) is actually mentioned in the reference list (L454), although not at the correct position. This will be corrected in the final version. We apologize for the mistake and thank you for spotting it.

Regarding the influence of solar forcing, short-lived cold spells recorded in the SST signal of core PP10-07 at 8.2, 7, 4, 2.9 and 1.7 ka BP indeed show similarity with the so-called "Bond cycles", at ca 8, 6, 4.5, 3, 1.8 and 0.5ky (Bond et al., 2001). However, the very short duration of these events in the Bay of Biscay calls for a derived phe-

nomenon rather than a direct influence of solar forcing on SST oscillations. The same idea is indirectly suggested in our paper when we refer to the millennial-scale storminess maxima reconstruction (Figure n°3 in the manuscript) of Sorrel et al., (2012). These authors concluded that the solar forcing was not a primary trigger for storminess maxima but did not exclude its possible influence as a weak external driver.

Though, comparing the SST signal of PP10-07 core with Bond cycle proxies, such as drifted ice indices, or directly with solar irradiance signal is a challenging suggestion. We will definitively try such approach (see the preliminary Figure R1) and include it in the final revised version, if possible. For information, this comparison was done and discussed at the scale of the last 2 ka BP in our 2015 paper (Mary et al., 2015).

Moreover, Morley et al., (2014) suggest that the strength of the Latitudinal Thermal Gradient (LTG), driven by contrasting distribution of insolation between polar and tropical latitudes, impacts meridional heat transport by oceanic systems and associated teleconnections. A sharp increase of the LTG occurs around 2000 BP. Such forcing may enhance NAC inflow toward northern latitude, which may explain the large, multi-millennial scale anomalies visible on the Bay of Biscay.

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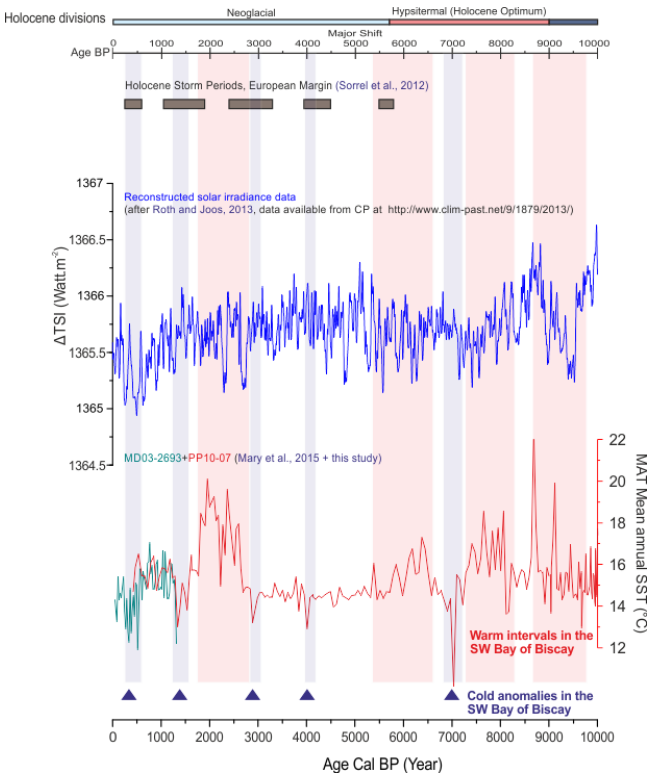

Fig. 1. Comparison of SST data of the Bay of Biscay with reconstructed solar irradiance data (after Roth and Joos, 2013) and reconstruction of Holocene storm periods (after Sorrel et al., 2012).