

Interactive comment on “Tropical Pacific spatial trend patterns in observed sea level: internal variability and/or anthropogenic signature?” by B. Meyssignac et al.

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Referee 1 is right, given the dependency of sea-level patterns on the thermosteric component in the tropical Pacific region, it is not very surprising to find the majority of the longer term variability of the sea level trends in this region arising from ENSO-like behaviour. Nevertheless, we would like to stress out that this point is only one of the conclusions reached by this work. Beside this ENSO-like behaviour we think that this paper shows 1) First that the sea level trend patterns observed over the last 17 years (since 1993) by satellite altimetry over the tropical Pacific are non stationary with time 2) Second that these patterns are actually the manifestation in the present day of a long

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term fluctuation (with periods between 25 yr and 35 yr) in sea level trends 3) Third that this long term fluctuation is dominated by the natural variability of the climate system. Now, since we are focusing on the tropical Pacific where sea level is largely dominated by its thermosteric component (Levitus et al. 2005, 2009) we have shown as well (as expected) that this long term fluctuation is linked to a ENSO-like behaviour. We have probably emphasized this point too much, in comparison with the other conclusions. We propose to change the conclusion to make it clearer. We propose to change the sentence on page 22 line 4: “So the “17 yr” trends observed by satellite altimetry in the Tropical Pacific are expected to fluctuate on these time scales. The results presented in Sect. 4.1 confirm that this is indeed the case” by the following sentence: “Nevertheless only few studies have suggested that sea level trends observed prior to the altimetry era changed with time in the past (Wunsch et al. 2007, Khol and Stammer 2008). Here we show that “17 yr” sea level trends are un-steady and fluctuated in the past with a characteristic time scale of around 25 yr”

Concerning the abstract, we propose the following changes in order to make it clearer: Page 2 line 2: replace “observed by satellite altimetry since 1993, focusing on” by “over” Page 2 line 14 replace “We compared them to the altimetry-based observed trends” by “We compared them to the observed altimetry-based trends (over the last 17 years)”

Concerning Figure 7 we attached the original version of Figure 7 splitted into 2 pieces with this comment. The resolution of both parts is 300 dpi. It should improve legibility.

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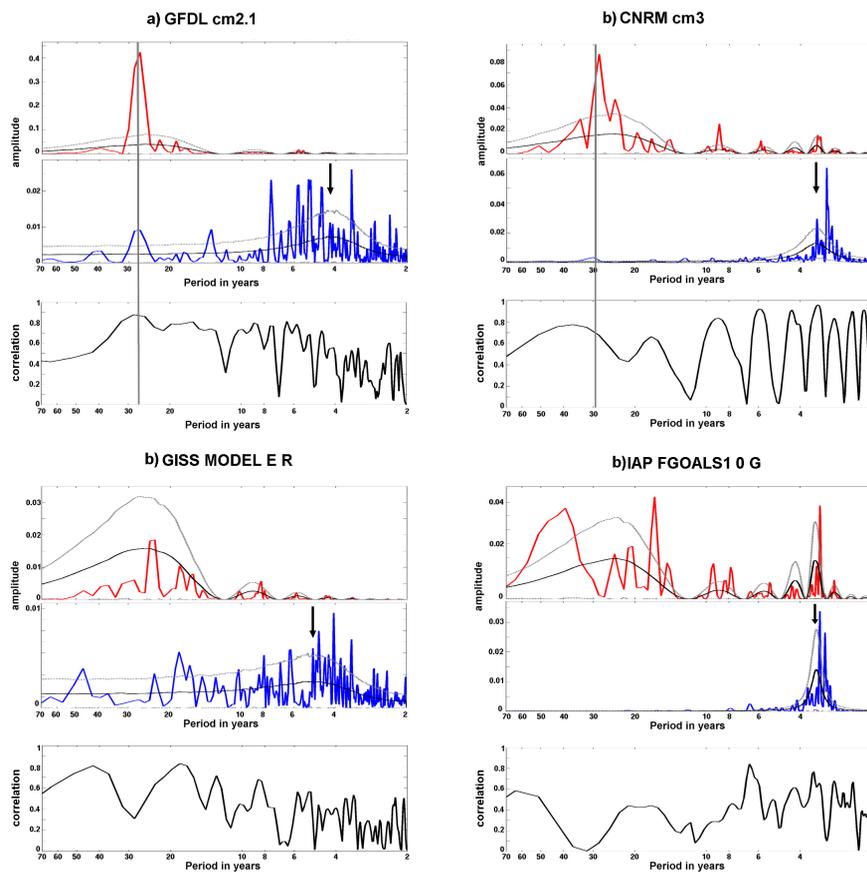


Fig. 1.

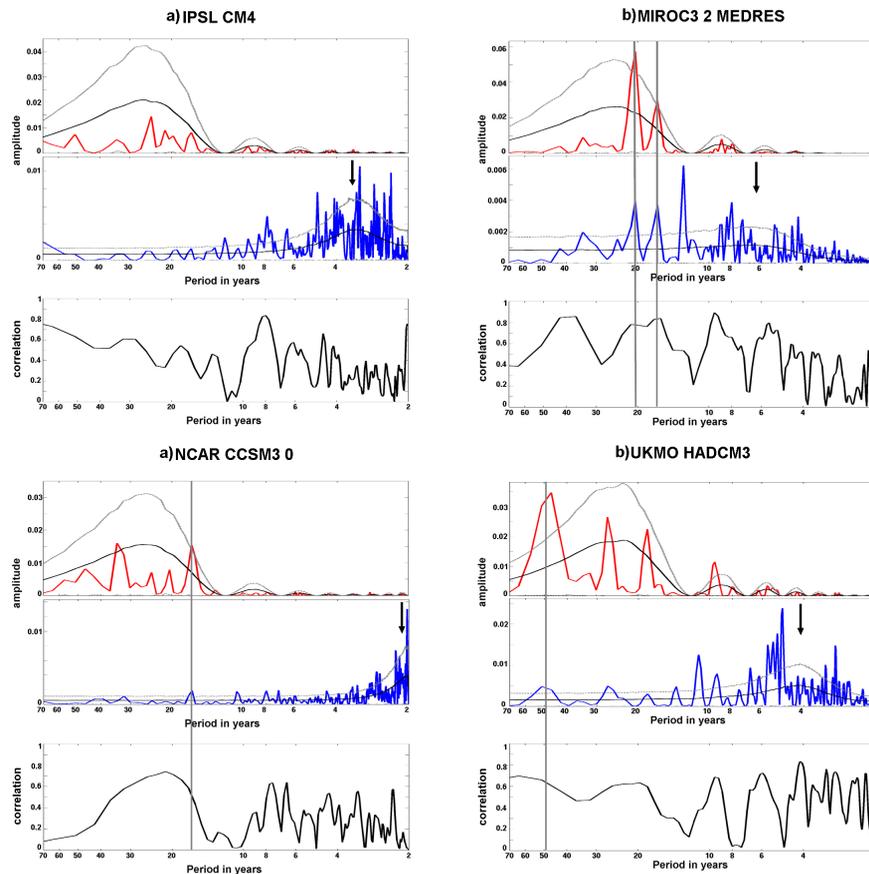


Fig. 2.