

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

### **Anonymous Referee #2**

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The authors are focusing on recent regional sea level trend patterns observed by satellite altimetry and investigate the temporal characteristics of the trend patterns. They conclude that the fluctuations of the trend patterns are due to the internal variability of the climate system with inter-decadal time-scale. Furthermore, they discuss power spectra of 20c3m-runs to detect signature of the external forcing. The spectral analysis shows that the external forcing does not affect the power spectra of the variability. I recommend publication of the manuscript with minor revisions. Please find below some suggestions to revise the manuscripts.

Main point: The authors present some interesting results, but I have a question about

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scientific position of “17 year trend” in this context. Although the authors might persist in discussing the 17-year trends, it seems that this study is more general topic concerning multi-decadal variability of sea level in the tropical pacific. For example, power spectra of 10-yr running mean of sea level change probably show same results. Sea level trends observed satellite altimetry might be one of the motivations of this study. However, I’m not sure why the authors discuss variability of sea level trend instead of sea level itself.

Minor points: Page 350, Line 11: The use of “natural variability” should be changed to “internal variability”.

Page 360, Line 12: The author compared the Nino3 index with mean sea level in Fig4a. However, trend of sea level are compared with Nino 3 index in Fig4b. Why don’t you compare the sea level trend with Nino 3 index trend?

Page 362, Line 18: It seems that the patterns in IAP are similar with others rather than that in NCAR. Please confirm figures.

Page 364, Line 28: Fig.5 -> Fig. 7?

Page 365, Line 19-21: How do they differ from the reconstructed pattern?

Page 365, Line 21: 5N -> 15N?

Page 366, Line 22: 20cm3 -> 20c3m

Page 371, Line 6: “natural variability” should this be “internal variability”? What does natural variability mean in this paper? Is it Solar radiation, volcanic forcing in external forcing or internal variability?

Figures: Please check figure symbols, same symbols (a or b) are shown in figures (Fig 6, 7, 9, 10).

Fig 7 caption, last sentence: an -> and

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Interactive comment on Clim. Past Discuss., 8, 349, 2012.

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