

Interactive comment on “Tune in on 11.57 μ Hz and listen to primary production” by Tom J. S. Cox et al.

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We thank this reviewer for her/his overall supportive comments and suggestions. Below we summarize the comments and suggestions, and we outline how we can incorporate these in a revised manuscript.

Comment: «The manuscript show new insights for the in situ calculation of primary production, which is a mile step in marine science. [...] The background and calculations is quite complicated. I assume that the author would like to address an audience like me, interested and familiar with PP measurements but not too deep into wavelength physics. To address this audience the author need to explain his ambitions more clearly. I wonder where this 11,57 μ HZ wavelength comes from. It is not mentioned in

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the paper. Some schematic overview figures might help to explain the calculation steps the wave length theory. It would be nice to have a few more background information about tidal consistent O1, Q1, P1 and K1. Most of the figures are poorly labelled, which makes the understanding even harder.»

Response: 1 cycle / day = 1 cycle per 86400 seconds = 11.57 micro Hz. (See also L36 of the introduction). A sketch will indeed clarify the concepts of the carrier wave with frequency 11.57 micro Hz for many readers. We will add it to a revised manuscript.

Tides are known to be a superposition of different periodic functions with well known frequencies. O1, Q1, P1 and K1 are the components of the tides, with close to diurnal frequency (See L27 of the Results). We will clarify this in a revised manuscript.

We will revise the labels of the figures.

Comment «In more detail: Introduction What does O1 Q1 K1 and P1 stand for?...»

Response: See above

Comment: «Page 4, line 28: where does the dynamic of the biomass come from?»

Response: A season of primary production is dynamically simulated, with a seasonal build-up and break-down of algal biomass . We will clarify this short section

Comment: «Results: Fig. 1: Can you add the measured O2 values into top figure og Fig. 1? Please add the unit to GPP. I would call it reconstructed GPP or GPP from complex demodulation. That would be less confusing.»

Response: We will do so in a revised version

Comment: «What is a 1 day low pass filter? Maybe you could already make more clear which method was used for which figure at the end in the material and method part. Maybe it is possible to build up the whole story less in the strict structure of a paper and rather as a story saying we did this, found this which lead us to the next step the use of a 1 day low pass filter.»

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Response: Here, we use a moving average filter with a width of 1 day. We will clarify this in a revised manuscript.

Comment: «Page 5, line 22: Most it be overestimation? Isn't it possible that your calculation is better than the simulation?»

Response: No, if the method would be perfect, the simulated GPP would be perfectly reproduced.

Comment: «Fig. 3: What is $|F(x)|$? It is very hard to find O1 and K1 . . . in the figure. Has F_x or f a unit? Please include.»

Response: We will clarify this

Comment: «Page 6, line 7 ($T = . . .$) What does it mean that the period of the amplitude is 365.1»

The text literally says: “the period of the amplitude variation is 365.1 days”. The superposition of K1 and P1 tidal harmonics result in a signal with frequency very close to the diel frequency. Whereas the frequency of this signal is constant (diurnal), the amplitude varies periodically. The period of this amplitude variation is 365.1 days. We will clarify this in a revised version.

«Fig. 5: (top) again axis label, what does List\$WLres mean? What index? Are there any units? (bottom) Units and label please. Where do I see P1, K1? What are the lines? In the description (bottom) is not mentioned. Plus the second sentence should be part of the results it is not a figure description.»

We will revise the figures

Comment: «The 11,57 μHz is not mentioned in the text at all.» Response: It is mentioned in the text (L36, introduction), but we will add a sketch to clarify, see above.

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