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Biogeosciences Discussions

# *Interactive comment on* "Changes in the partial pressure of carbon dioxide in the Mauritanian-Cape Verde upwelling region between 2005 and 2012" *by* Melchor González-Dávila et al.

**Anonymous Referee #2**

Received and published: 29 May 2017

Review The authors presen a 7 year data record of surface ocean fCO2 observations in the upwelling region off Northwest Africa. The manuscript is a solid piece of science and the data are well described. It is a very nice example how valuable data from carbon-VOS lines can be and how much we can learn from sutainable observations. The work fits perfectly in the scope of "Biogeosciences". This said I have one major criticism: The "Results and Discussion" part is very detailed and very long, which is not bad itself. In contrast, the conclusions are very short and the main point of the paper gets a little bit diluted. The paper reads a little bit like a data paper with a lot of description and only a small part of new knowledge. One idea would be having a short summary of the major findings in each part of section 3. Then taking this summaries



and clearly highlight the major findings of this manuscript. Furthermore I suggest that the authors ask a native English speaker for proof reading.

Specific comments:

line 42: the authors call it here "opportunity ship" but later VOS line. I think VOS line is a commonly used term, so I suggest to indroduce it here and the n use it consequently in the rest of the paper.

Line 58: . . . researcheRs . . .

Line 67: use "wind speed" instead of only "wind"

Line 68: . . . supportS . . .

Line 73/74: . . . different wind databases for the . . .

Line 88: . . .QUIMA-VOS line . . .

Line 102: The term "VOS" is not yet introduced

Line 118: call is VOS line

Line 125: us ". . . seawater flow but varied . . ." instead of ". . . seawater flux used but varied . . ."

Line 133: ". . . imposed . . ."

Lines 136-140: The authors report an accuracy of 1 $\mu$atm but the standard gases don't bracket the expected fCO2 values. This is not according to SOP's and at least for the values outside the standard range the accuracy estimate should be lower.

Lines 154 ff.: To my knowledge the parameterization of Wanninkhoff (1992) has some problems and shouldn't be used. I suggest using Nightingale 2000 which has shown to produce robust flux estimates.

Line 161: what does the * mean?

Lines 166 ff: Is it proved that the general seasonal pattern follows such an sinodial approach?

Lines 222 ff.: Sentence sounds odd. Please rephrase.

Line 225: The authors mention a confidence interval of 9m2 s-1 for the upwelling index (UI) but the scale of in Figure 3 a) is on the order of 10e-3 m2 s-1. This looks like a quite large confidence interval to me.

Line 240 ff.: "South of 15°N ..." ; This conclusion is not clear to me. Can you please explain why a decreasing UI comes directly from an increasing SST!?

Line 265: use SST and SSS

Lines 307/308: Sounds odd, please rephrase

Line 312: "seasons" instead of "sea1sons"

Lines 324 ff.: 4.3% would translate into an error between 15 and 26 $\mu$atm. I think its better to give the range since the dataset includes data over a wide range.

Lines 330 ff.: The word "and" in line 330 can be deleted. I don't really understand the meaning of comparing NfCO2 (which is temp independent) with temperature again. Please explain the deeper meaning.

Line 368: "average" instead of "averate"

Line 458 ff.: sounds odd, please rephrase

Line 466-469: I don't understand the sentence. Please rephrase.

Line 472 ff.: The authors mention the dependence of the upwelling region on climate change forcing. Please say here clearly which forcing you mean and what the exact effect is.

Line 484: Use "VOS line"



Figure 2:

- please say if red or blue denotes upwelling events. It is somehow clear but this information would improve the readability.

Figure 3:

- are the units correct (see also comment above regarding the confidence interval)

- please add Latidude in °N to the y-axix

- line 228 and 229: "panel" instead of "pannel"

- the authors use "year-1" and "/year" in the same figure. Please use it consistent.

Figure 4:

- Can you name the month that you used for summer, fall, winter and spring?

Figure 5:

- Instead of showing fCO2 (measured) and NfCO2 I would suggest just showing the difference (NfCO2 – FCO2 (Measured)). Then there is no need to compare panel by panel, instead the deviations would be clearly visible.

Figure 7:

- Can you name the month that you used for summer, fall, winter and spring?

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