

## ***Interactive comment on*** **“Temperature-dependence of planktonic metabolism in the Subtropical North Atlantic Ocean” by L. S. García-Corral et al.**

**Anonymous Referee #2**

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General comments:

With the GPP, CR data collected from 3 sub-tropical N-Atlantic cruises representing the spring, summer and winter seasons, the authors addressed two parts in this manuscript. Firstly, they described the trophic conditions (auto- vs. hetero-) of the biogeographic provinces of the subtropical North Atlantic area. The authors argued that increased respiration might lead to a positive feedback and more heterotrophy in the surface subtropical ocean. Secondly, they analyzed the temperature response of the GPPChl-a and CRChl-a, and then compared the activation energies derived from the field data analysis to those of the short-termed (24 hrs) manipulation experiments. They showed that activation energies derived from the field data analysis were very

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similar to those derive experimentally by temperature manipulations. For the first part, I have to agree with the comments from reviewer #1 that the field data should be re-analyzed with clear statistical description. My comment/suggestions are focusing on the second part.

(A). The authors should justify the physiological and ecological implications of the positive temperature responses of GPPChl-a and CRChl-a derived from this study. Living organisms live on materials but not temperature, temperature is a physical factor that may elevate the reaction rates (by lowering down the activation energy) only when the supply rates of materials are not limiting. Therefore, positive temperature responses (as shown in Figs. 4 & 5, and Table 4) can occur only when other factors, such as light and nutrient supply (for GPPChl-a) as well as organic substrate supply (for CRChl-a), are not limiting. Is this true for the systems that the authors studied?

(B). I am a little bit concern about using the “integrated” values to make comparison (page 3251, paragraphs 2 & 3). It would be more subjective to use the “depth-averaged” values. That is, dividing the integrated value with the deepest sampling depth of that station.

Specific comments:

1. The authors mentioned that they did 13 manipulation experiments in Leg 2 (spring season), but showed only one equation and one Q10 value in Table 4. Please explain.
2. For readers' convenience, the panels in Figs. 2 & 3 should be marked with capital A, B, C...etc. BTW, Fig. 2 showed the patterns of salinity, but the authors did not give any description in the text.
3. For better presentation, the authors may consider revising Table 4 to show their own Ea/Q10 values and the values published by other studies.