EGUsphere, author comment AC1
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Reply on RC1

Anna Kolomijeca et al.

Author comment on "An update on dissolved methane distribution in the subtropical North Atlantic Ocean" by Anna Kolomijeca et al., EGUsphere, https://doi.org/10.5194/egusphere-2022-360-AC1, 2022

We thank the reviewer for this feedback and appreciate the concerns regarding the individual contribution of both *Prochlorococcus* and *Synechococcus* to OMP. The authors note, that the scope of this work was not to measure and quantify the specific methane production by these two prominent primary producers, but to correlate their occurrence and distribution to areas of interest in regards to oceanic methane production in order to highlight the involvement of the cyanobacterial community towards the OMP. Furthermore, we provide insight into the metabolic mechanisms involved in methane production and relate these to concurring nutrient regimes present in the area of study. However, we agree, that there was a need to further discuss the individual contribution of different primary producers to oceanic methane production and we now include a paragraph in the discussion presenting individual rates of methane production from other studies for different primary producers, including both mentioned in the present manuscript and other abundant groups. The authors would like to mention, that to measure individual methane production rates in situ is rather difficult and requires additional experimental design and setup, i.e. mesocosms and/or sensor-controlled incubation settings and the distinction of individual rates per organism would be further complicated when using natural communities. As stated by the reviewer, our work provides a solid base for future research of the OMP, which should focus on such further developed experimental studies to estimate individual rates of different marine organisms. Here, we present observational high-resolution data to highlight the need for further research regarding OMP. Lastly, we improved the language of our manuscript and hope that we could satisfy the reviewer's comments with the revised version. We would like to thank the reviewer again and hope that the revised manuscript will be considered for acceptance.

On behalf of all authors,

Anna Kolomijeca