Biogeosciences Discussions

Biogeosciences Discuss., referee comment RC2
https://doi.org/10.5194/bg-2021-229-RC2, 2021

Comment on bg-2021-229

Anonymous Referee #2

Referee comment on "What can we learn from amino acids about oceanic organic matter cycling and degradation?" by Birgit Gaye et al., Biogeosciences Discuss., https://doi.org/10.5194/bg-2021-229-RC2, 2021

Though amino acid composition has been regularly measured as an indicator of organic matter degradation, the varied sources and processes beyond heterotrophic degradation shift the AA composition and limited its application in diverse marine environments. It has been frequently found in recent publication that the DI index was inappropriately applied to samples that were clearly regulated by mechanisms different from Dauwi's dataset. However, the manuscript by Gaye et al. analyzed amino acid composition from amazingly abundant samples covering traps, sediment, suspended particles, the seawater and pore water from varied regions. This provides a complete dataset to reliably reflect the variation in amino acid composition among major pools of amino acids in the ocean. This work well fits the scopes of Biogeoscience. The manuscript was well written and the conclusion is convincing and informative. I would suggest the publication of this work with some minor editions as followings.

Specific comments:

- Considering the spatial coverage and large range of concentrations, whether it is suitable to calculate the decay functions (Fig. 3) using the entire dataset?
- Were Gluam and Galam measured simultaneously with the amino acids?
- One thing confused me a lot is where comes the amino acids enriched in pore water, if there is no exchange between pore water and sediment.
- Line 268, "carbon and N" to "carbon and nitrogen"
- Line 406 "Least degraded" to "most degraded"?
- Line 436, "increasewith" to "increase with"
- Line 725, "Tab. 1" to "Table. 1"