

Interactive comment on “Aphotic N₂ fixation along an oligotrophic to ultraoligotrophic transect in the Western Tropical South Pacific Ocean” by Mar Benavides et al.

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In this research paper, Benavides et al., make a very solid contribution to current knowledge of N₂ fixation rates, N₂-fixer diversity, and overall parameters associated to aphotic regions of the oceans. The research presented is excellent in all its aspects- introduction, MM, results and discussion are solid, straightforward, and present data produced with state-of-the art technologies. Although local N₂ fixation rates are low compared to some photic environments, they were constantly found along the sampling gradient reported, and integrated rates suggested in this research can consist of up to ~50% of surface rates. I believe this is one of the main contributions of this

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research. A second main contribution is the finding of *V. diazotrophicus* related phylogenotypes dominating at the 650 dbar depth, associated to SAMW- which suggests a relationship between nifH diversity and a large-scale water mass. Further, the results on *Trichodesmium* diversity found in the aphotic layers, suggesting the effect of large cyanobacterial bloom sinking, is also very relevant to understand the N cycle.

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