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Interactive comment on "Evolution of dissolved and particulate chromophoric materials during the VAHINE mesocosm experiment in the New Caledonian coral lagoon (South West Pacific)" *by* M. Tedetti et al.

Anonymous Referee #1

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GENERAL COMMENTS This is an appealing piece of work presenting a very complete study about chromophoric dissolved organic matter, biogeochemical and biological parameters in a mesocosm experiment in a tropical oligotrophic LNLC ecosystem, which have been poorly studied. The novelty of this work remains in the dynamic of the dissolved and particulate organic matter with that of N2 fixation, where N2 fixers and picophytoplankton play an essential role. The experimental approach used by the authors is appropriate to support the scientific findings of the manuscript, it is very well written and structured, and obtain sound conclusions. In summary, the work is of in-

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terest for the audience of Biogeosciences and meets the high standards required for publication in this leading journal. SPECIFIC COMMENTS Page 12. Lines 1-13. The conversion factor from quinine sulphate to raman units is very valuable due to the lack of uniformity regarding fluorescence normalization and conversion units, which hinder the comparison with other studies.

Page 18. Lines 1-6. It has been very surprising that many chlorophyll and carotenoid peaks (or "shoulders") have been found. There are barely studies that find these amounts of peaks in a single mesocosm experiment or study site.

Page 22. Line 3. Why did not you start measuring the slope at 350 nm instead of 370 nm? Have you calculated the slopes over the range 350-500 nm? This would allow the comparison with other studies that use this range as you mention in Line 4-5 of page 22.

Page 23. Lines 10-14. I disagree with the photo-resistancy of UVC humic-like fluorophore (peak A). In fact, the increase with depth of the humic-like FDOM components in the upper 200 m has been followed as a regular pattern previously reported for open ocean waters. See for example the studies of Kowalczuk et al., 2013; Lønborg et al., 2015; Timko et al., 2015 in the Atlantic, Yamashita et al., 2007 in the Southern ocean, Omori et al., 2010; Yamashita et al., 2015 in the Pacific ocean or the global cruise of Jørgensen et al. (2011).

TECHNICAL CORRECTIONS Page 24. Line 20. Remove ">" before 0.040.

Page 28. Line 24-25. Remove "Tryptophan- and tyrosine-like fluorophores are part of the DON pool" because it is repeated in Page 29, Line 14-15.

USEFUL REFERENCES Jørgensen, L., and others. 2011. Global trends in the fluorescence characteristics and distribution of marine dissolved organic matter. Mar. Chem. 126: 139–148, doi: 10.1016/j.marchem.2011.05.002.

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Lønborg, C., Yokokawa, T., Herndl, G. J., and Álvarez-Salgado, X. A. 2015. Production and degradation of fluorescent dissolved organic matter in surface waters of the eastern north Atlantic ocean. Deep Sea Res. Part I 96: 28–37, doi: 10.1016/j.dsr.2014.11.001.

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