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Interactive comment on "Dinitrogen fixation and dissolved organic nitrogen fueled primary production and particulate export during the VAHINE mesocosms experiment (New Caledonia lagoon)" *by* H. Berthelot et al.

Anonymous Referee #1

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The present study clearly demonstrated by a mesocosms experiment that efficiency of export production and DON release rate of fixed nitrogen varied with diazotroph community. This manuscript is well written and well organized, and it presents valuable scientific insights. Although I'm almost satisfied with this content, I have some questions.

If diazotrophs release almost nitrogen they fixed and primary production increased using the released nitrogen, f-ratio could decrease since regenerated production is likely to be enhanced. The decrease of f-ratio was observed in a time-series experiment in

western Pacific warm pool when nitrogen fixation and primary production showed an increasing trend (Shiozaki et al., 2013, L&O). Please consider the difference between their results and your ones.

Recent study showed that DDA contributed to export production efficiently (Karl et al., 2012, PNAS). Meanwhile, the present study indicated that the production driven by UCYN-C was more efficient to promote export production than by DDA (P4293, L4-5). What environment makes UCYN-C flourish? Is this result consistent with the result of Karl et al. (2012)?

Specific comment P4275 L15 Correct to N2 fixation.

P4290 L8 The unit of nitrate concentration is nM here. But that is μM in P4285 L2,3. The authors should use unit consistently.

P4290 L10 Jickells et al (2005) is not appropriate reference here.

P4292 L1-5 This discussion seems not to fit the context.

P4294 "the diazotrophs are known to over-fix C relative to N" Need citation.

Interactive comment on Biogeosciences Discuss., 12, 4273, 2015.