

Interactive comment on “N₂ fixation in eddies of the eastern tropical South Pacific Ocean” by C. R. Löscher et al.

Anonymous Referee #2

Received and published: 25 January 2016

This manuscript provides results from the analysis of biogeochemical parameters in three different eddies (two anticyclonic and one cyclonic) in the eastern tropical South Pacific Ocean. Direct measurements of carbon and nitrogen fixation are presented, completed with phylogenetic analysis of *nifH* transcripts. In general the authors succeed in proving the concurrence of N₂ fixation and N loss processes. This manuscript is very well prepared and written. Moreover, experimental procedure and concept are thoroughly planned. I only have some minor comments to make and greatly recommend publication.

Below are some more specific suggestions:

Material and Methods 1) Page 18952, line 26 the authors state” The filtrations were stopped after one hour since high particle load in surface waters often lead to a clog-
C9395

ging of the filters.” Please provide detail on how much volume has passed the filter by then (Table in Suppl). Likewise, how do the authors consider the error introduced by stopping the filtration abruptly e.g. considering the sedimentation of particles on the filter. Why did the author’s not adjusted the filtration volume accordingly, and why did they choose one hour? Did they filter the rest onto a second filter and measure both? 2) Page 18950, line 11: How was the age of the eddy determined? 3) Page 18951, line 2: Does P* also stimulate heterotrophic N₂ fixation? 4) Page 18951, Line 8, also line 18: Do the author ’s mean N₂/Ar? 5) Page 18952, Line 10-12:Please add the exact initial enrichments for each bottle, e.g. in a table or give a range. 6) Page 18952, Line 25: Replace “-“ by “~”.

Results and Discussion

7) Figure 3- What sustained C-fixation in A1 below 200 m and was there any light available at that depth? 8) Page 18957, Line 5:There are already quantifications so the authors are not the first who provide quantitative N₂ fixation rates. Please correct. 9) Page 18967: Fig. 1. SSHA is not an acronym for Aviso sea level anomaly- please correct. 10) Page 18969, Fig. 3: Please enlarge numbers and legends- it s hard to read. 11) Page 18972, Fig. 6. Please delete repetition of between “N₂ fixation and O₂ and N₂ fixation and O₂”

Interactive comment on Biogeosciences Discuss., 12, 18945, 2015.