

## ***Interactive comment on “Latitudinal distribution of *Trichodesmium* spp. and N<sub>2</sub> fixation in the Atlantic Ocean” by A. Fernández et al.***

**Anonymous Referee #1**

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This is a well written and interesting paper focused on the latitudinal variation in *Trichodesmium* abundance and rates of nitrogen fixation in the north, equatorial and south Atlantic (sub) tropical ocean. The data presented supplements growing evidence for low but consistent rates of nitrogen fixation in the south Atlantic, and substantial rates of nitrogen fixation in the equatorial region. A few details are missing from the paper:

1. The authors extrapolate N<sub>2</sub> fixation data from two transects to the north and south Atlantic basins but did not include the assumptions used in their calculations; (a) did the authors assume that nitrogen fixation occurs over 365 days per year, (b) what longitudinal limits were used to scale to the basin. Please include these details.
2. Did the authors compare counts of *Trichodesmium* from the underway to samples captured using a Niskin bottle or bucket? The method of collecting *Trichodesmium*

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filaments (i.e. filtering 50 to 130L of seawater from the underway seawater supply through a 40µm mesh) seems a little odd. Did the authors check if filaments were destroyed during this process. What diameter was the 40µm mesh?

3. What was the precision of the N isotope analysis? It would be useful to report the precision considering the authors are reporting very low rates of nitrogen fixation which relies on being able to detect a small change in the <sup>15</sup>N content between the T<sub>zero</sub> and T<sub>final</sub> filters.

The manuscript is a little repetitive at times, e.g. on page 2205 and twice on page 2206, the authors repeat that iron controls the distribution of nitrogen fixation in the Atlantic, yet this is not the main focus on this manuscript. The authors appear to have focused on the iron story, a finding that has been published elsewhere, and not their own findings, which appear to be that nitrogen fixation was highest in the equatorial region, a region where new N is traditionally thought to be supplied via upwelling, or in the south Atlantic, where there is only a handful of published rates of nitrogen fixation.

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