

## ***Interactive comment on “Effect of ammonium input over the distribution of iron in the seawater and the phytoplankton in a mesocosm experiment in a North Patagonian fjord” by N. Sanchez et al.***

**Anonymous Referee #1**

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This manuscript describes an interesting experiment where the consequences of nutrient addition to Patagonian fjord waters are investigated, with a particular focus on iron speciation. This work is of particular relevance given the significant development in aquaculture in this area.

The measurements have been carried out carefully, although the authors note that it was not always possible to maintain the highest standards of trace metal clean handling. Interpretation of the results is somewhat hampered by the use, for good practical reasons, of operational speciation methods (Chelex and DGT) that do not give unequivocal information on Fe speciation.

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I recommend that the manuscript be published, but that the authors be invited to revise the manuscript in respect of the following points:

p13742, line 12: it is the ratio of uptake rates of  $\text{NH}_4^+$  and  $\text{NO}_3^-$  that is used to estimate new production, not their concentration ratio.

p13743, line 15: this sentence is unclear

p13746, line 18: dilution of 61 mg?? units?

section 2.8, Table 2: are these full procedural blanks?

Figures 6 and 7: is it possible to assess the mass balance for Fe in the different mesocosms? This would help to address the concerns, that the authors themselves raise, about possible contamination.

Section 4.1: the discussion here seems to be unduly empirical. Uptake of  $\text{NH}_4^+$  rather than  $\text{NO}_3^-$  reduces the Fe requirement for growth since no Fe is required for nitrate reductase. The observation that additions of  $\text{NH}_4^+$  reduce the Fe:C ratio suggest a switch to  $\text{NH}_4^+$ -fuelled growth with a consequently lower Fe requirement. It would be clearer to discuss the results using this Fe/N coupling as a starting point.

p13754, line 12: it is stated that  $\text{NH}_4^+$  uptake at less energy expense leads to a lesser preference over  $\text{NO}_3^-$ . Surely the other way around?

General points:

Some abbreviations such as LSL and  $\mu/n$  are used without explanation.

The English grammar should be corrected by a native speaker

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