

Interactive comment on “Co-limitation by iron, silicate, and light of three Southern Ocean diatom species” by L. J. Hoffmann et al.

A. Watson (Editor)

a.watson@uea.ac.uk

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This paper gives the results of a systematic study of three factors frequently cited as among the most important to limit growth rates of diatoms. Three species of diatom are studied, two of which are mostly found in the Southern Ocean while one is more generally distributed. I am thoroughly in favour of the approach of systematically studying these co-factors in the laboratory, as a necessary step to correctly interpret field observations.

However, the reviewers highlight a fundamental problem with this paper, which is that these laboratory results cannot properly be related to actual conditions in the Southern Ocean. In particular, the silicate concentrations used in the growth medium are very high: 200 micromol per litre for the “high” and 20 for the “low” silicate treatment. The

high silicate treatment is thus at concentrations much higher than seen anywhere in the real surface ocean. The concentration in the “low iron” treatment is not specified, only the difference between this and the high iron treatments.

Both reviewers recommend rejection of the present paper for Biogeosciences, and this is my editorial decision also. I would welcome a new submission if new results can help answer these concerns.

I am sorry to have reached this negative decision, but pleased to say that the recommendation for the companion paper on stoichiometric changes is much more positive.

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