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Interactive comment on “CO₂-induced seawater acidification affects physiological performance of the marine diatom *Phaeodactylum tricorutum*” by Y. Wu et al.

Anonymous Referee #2

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This is a nicely written paper, describing potential impacts of elevated CO₂ on the physiological performance of the diatom, *Phaeodactylum tricorutum*.

The work has been carried out appropriately and is reported in a generally clear and concise manner. The results are straightforward and entirely consistent with what might be expected from the downregulation of CO₂ concentrating mechanisms (CCMs) in an elevated CO₂ state. The measurements of increased dark respiration and photoinhibition in elevated CO₂ are especially interesting.

For the non-specialist, it would be worth pointing out that changes in K_{1/2} (CO₂) (but not necessarily K_{1/2}(DIC)) can be used as a proxy for changes in CCM activity. The

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authors should therefore also consider recalculating the K1/2 (DIC) values presented in Fig 3 as K1/2 (CO₂).

A passing comment - the authors refer to the impact of ocean acidification on coccolithophores as being negative (as indeed found by Riebesell et al 2000), but should at least refer to the other examples of work on coccolithophores that have shown no effect or a stimulation of calcification under high CO₂.

In the methods and results the authors refer to high C or low C cultures then in the discussion on In 5 p 3867 switch to referring to low and high pH cultures. I would suggest for clarity they use consistent terminology.

Interactive comment on Biogeosciences Discuss., 7, 3855, 2010.

BGD

7, C1549–C1550, 2010

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