Coccolith response to Subantarctic South Atlantic iron fertilization and surface ocean acidification during the last 20 ky

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Here, we present the evolution of paleoproductivity surface water conditions for the last deglaciation using coccolithophores assemblages at Site PS2498-1 in the Subantarctic South Atlantic Ocean (44°15' S, 14°23' W). This area of the Southern Ocean is characterized by strong hydrographic gradients, specifically, surface Antarctic Circumpolar Current shifts and mid-depth Atlantic Meridional Overturnign Circulation [1, 2]. Site PS2498-1 is located at 3.783 m, below the calcite saturation horizon (3.690 m) and above the lysocline (4.175m). The pristine coccolith assemblages have been partially dissolved during the last part of the Last Glacial Maximum (LGM). Iron fertilization events during the glacial could have favered the opportunistic species *Emiliania huxleyi*, which, however has been moslty dissolved. On the contrary, low surface pH and nutrient-depleted waters during the Holocene, induced high *E. huxleyi* and *Calcidiscus leptoporus* absolute abundances, respectively. We speculate that the interglacial surface ocean acidification could have caused a change in the coccolithophore community structure and also in *E. huxleyi* and *C. leptoporus* size. We observe an increase in *E. huxleyi* mass (pg) which we would be likely related to an adaptation to undersaturated water conditions [3].

[1] Mejía et al., (2014) Paleoceanography **29**, 697-714.
[2] Martínez-García et al., (2014) Science **343**, 1347-1350.
[3] Müller et al., (2017) The ISME Journal **11**, 1777–1787.