

Interactive comment on “Calcification and distribution of extant coccolithophores across the Drake Passage during late austral summer 2016” by Mariem Saavedra-Pellitero et al.

Anonymous Referee #2

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The paper presents well documented distributional data of coccolithophores and in particular *E. huxleyi* morphotypes across the oceanographic fronts in the area of the Drake Passage, an important zone for monitoring the path of the Antarctic Circumpolar Current. The presentation of the methods and data is clear and the discussion is well supported, showing a consistent latitudinal trend of decreasing coccolith mass along with temperature decrease and a gradient in carbonate chemistry parameters. Overall the manuscript represents a substantial contribution in the field of coccolithophore studies, adding new information and providing accurate measurements of both *Ehux* types and coccolith mass. The data are well presented, with figures and plates of excellent quality. Some points deserve further discussion, in particular: section 4.3

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is well organized and points to significant changes in the coccolith mass of *E. huxleyi* across the different fronts and zones of the ACC. However, while the degree of calcification is considered as the main driver of coccolith mass variation (but the assessment of degree of calcification and mass is done with different techniques, so there can be no direct attribution), there is no discussion about the influence of coccolith size on coccolith mass, e.g. type C is smaller than B/C which is smaller than type B, by definition. Carbonate chemistry parameters. The discussion of the relation between coccolithophore calcification and the carbonate chemistry of the water column should be considered even more carefully, given the fact that the data are not measured in the same samples and the pattern of pH variation is not so clear – a different trend appears if the different calculations are considered, e.g. fig. 12. However, the correlation with Ω calcite seems meaningful, looking at the graphs, but this parameter is not considered in the discussion. The last sentence of the conclusion is however not supported and does not explain how climate change will affect the calcification mode of coccolithophores, given that no clear relationship between the degree of calcification and the carbonate chemistry of sea water are established yet, but rather different correlations seem to exist in different areas of the world oceans and under different oceanographic conditions, so the question remains open. Page 11 line 12: also Malinverno et al., 2016 show the shift in dominance from coccolithophores to diatoms in water samples across the PF / sACCf, so this could be cited.

Typos: Page 1, line 22: classified » identified Page 2, line 6: delete “substantial” which is repeated twice Page 2, line 7: dissolved carbon » dissolved inorganic carbon Page 2, line 16: phosphate is mis-spelled Page 2, line 28: the future » in the future Page 4, line 6: (2004) is repeated Page 7 line 20: this taxa » this taxon Page 8 line 1: later » latter Page 13 line 5: established » established by

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