



EGUsphere, referee comment RC1
<https://doi.org/10.5194/egusphere-2022-1329-RC1>, 2023
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Comment on egusphere-2022-1329

Anonymous Referee #1

Referee comment on "Fossil coccolith morphological attributes as a new proxy for deep ocean carbonate chemistry" by Amanda Gerotto et al., EGU sphere,
<https://doi.org/10.5194/egusphere-2022-1329-RC1>, 2023

The project is well designed and has produced some interesting results along with a well-written manuscript to accompany it. The project has identified a novel proxy for quantifying rates of carbonate dissolution with valid methods clearly outlined. Results are clearly displayed in figures and tables with strong explanations of the proxy application as well as cautions.

Questions for authors to address if they feel it would add to the story:

It would be helpful to hear whether these were the results expected by the authors.

The abstract mentions that degree of dissolution and size-selective dissolution is influenced by assemblage composition but this is not fully addressed in the text.

Could elaborate on species/assemblage influence – fragility due to size, crystal composition etc. this is left rather vague.

How might this measurement influence global records of coccoliths?

Specific comments by line:

- 11 – critical to elucidating
- 14 – complex not complexity
- 15 – during an organism's life cycle
- 21 – samples from the South China Sea
- 22 – surface sediments were
- 24 – statistical analysis indicates that

39 – ocean CO₂ is influenced (atmospheric CO₂ = pCO₂)

42-43 – concentration, and carbonate

56 – variations in the ocean carbon

65-66 – provides a quantitative

73 – called coccoliths. Coccoliths

74 – up to 80 % of deep-sea

75 – changes in coccolith morphology are believed

89 – there has been no study

96 – between coccolithophore biometry

97 – building on these results

99 – it has also been demonstrated

104 – studies that systematically explore the drivers

121 – by shallow passages to the north and south

122 – water exchange between

125 – East Asian Monsoon (EAM; Wang and Li, 2009)

148-149 – relatively low DIC and TALK and high pH

169 – add reference for smear slide preparation technique

170 – dissolution experiments using

171 – obtained from a Late Pleistocene

173 – what is the thinner species that is being referred to?

175 – suspension was separated into

176 – each with a volume

177 – has traditionally been used

198 – parameters of coccoliths in the

209 – calculated using the formula by Young

210 – obtained from C-Calcita

229 – coccolithophorid is observed in

306-307 – between several coccolith morphological parameters and bottom

360-361 – rephrase

427-428 – deep ocean deposits with lower sedimentary

442 – coccolith dissolution in different

444 – ks of coccolith is a more

465 – variation of coccoliths be employed

470 – to trace evolutionary trends

488 – focusing on coccolithophore evolutionary histories

493 – increase in dissolution

494 – interpreted as dissolution

514 – more prone to dissolution (without “suffer”)

Continuity:

Vs or vs.? Should it not be *versus*/vs ?

Sea floor or sea-floor?