

Interactive comment on “Seasonality of archaeal lipid flux and GDGT-based thermometry in sinking articles of high latitude oceans: Fram Strait (79° N) and Antarctic Polar Front (50° S)” by Eunmi Park et al.

Anonymous Referee #1

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This is a very detailed assessment of the sinking dynamics and depth distribution of marine GDGTs and associated proxy indices at two high latitude locations. Particularly, I find it remarkable that OH-GDGT may be a promising alternative temperature proxy to GDGTs in these regions.

I have a couple of mostly minor comments/suggestion below. I am, however, a bit concerned about leaving out data points, without reasonable justification (see comments below).

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P1-12 remove 'the'

P1-13 'proxies' and 'proxy index'

P1-15 '... where the original TEX86 proxy calibration shows a larger scatter.'

P1-21 remove 'during transport', it's redundant

P2-10 '... a logarithmic calibration of TEX86L, excluding the Crenarchaeol regio isomer, was suggested ...'

P4-20 'stratification' instead of 'stability'?

P5-05 'Afterwards'

P8-12-15 Why were these samples excluded? Is there reason to believe that something is wrong with the analyses? If not, the statistics should include all samples.

P9-25 check subscript

P10-6 '... vary depending on their composition... '

P10-10 '... preferentially incorporated into ...'

P10-20-22 Again, please provide reasoning for excluding samples from correlation analyses, or revise.

P12-21-22 What evidence do you base this statement on? Include explanation, or reference to figure.

P12-23-24 This argument is not quite clear to me. Which 'result' are you referring to?

P14-25-28 How exactly (over which nutrient) do you think Thaumarchaeota compete with phytoplankton? Does phytoplankton use ammonium as a N source?

P15-7-10 At which depth die Fischer et al. observe similar patterns? It is also not clear, which location are you referring to. Therefore, the conclusion you make is not clear either.

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P16-30 This statement should be stronger (remove 'potentially'), because water T has an effect on GDGTs, and not the other way round.

P17-2 'Larger scatter towards colder temperatures ...' P17-4 '...relationship of maSSTs AND TEX86L values ...'

P18-7 'similar range as'

P18-13 'Warm biases AS with the ...'

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P19-16-17 '... or OH-GDGT-based calibrations ... the limitations of a single global TEX86L calibration ... '

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