

Interactive comment on “A new 30,000 year chronology for rapidly deposited sediments on the Lomonosov Ridge using bulk radiocarbon dating and probabilistic stratigraphic alignment” by Francesco Muschitiello et al.

Anonymous Referee #1

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Muschitiello 2019-GChron LomRidge review

Chronology is key to interpreting complex paleoceanographic events in the Arctic Ocea. This paper makes great strides towards better chronology of late MIS 3-MIS 1, the last 30 kyr, due to high sedimentation rates and statistical analyses. A particularly important results is the ability to correlate the marine record to Greenland ice cores. These results for younger Quaternary records also have implications for understating older deglacial sequences beyond the limits of ^{14}C dating. The statistical methods are somewhat complex and novel, so I recommend a statistician familiar with stratigraphy read the

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paper too. The distinction between late MIS 3 ages of 25-30k and MIS 4-3 ages argued by others for the nearby PS2471-1 core is critical since MIS 3 30-40ka seems to be a very warm interstadial period with abundant calcareous preservation throughout the Arctic. I would thus like to see more paleoceanographic interpretation of this time period. This especially applies not only to MIS 3, but older and younger to paleo-sea ice reconstructions from PS2471-1 – In addition, How does the age reinterpretation affect ideas about glacial maximum sea ice and ice shelf from other regions and ridges in the central Arctic Ocean? Finally, the alignment of the GISP ice core and 312PC porosity data in Fig 3 is impressive, a more extended discussion of the paleoclimatology and climate dynamics of this near synchronicity is needed.

Specific minor comments On page 3 I'd like to see a little more discussion of the concerns about changing delta R values. It also says fossil content is minor, can you expand what you mean? No forams? Ostracodes? Few molluscs for dating?

Please also note the supplement to this comment:

<https://www.geochronology-discuss.net/gchron-2019-16/gchron-2019-16-RC1-supplement.pdf>

Interactive comment on Geochronology Discuss., <https://doi.org/10.5194/gchron-2019-16>, 2019.

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