

Interactive comment on “Short communication: Driftwood provides reliable chronological markers in Arctic coastal deposits” by Lasse Sander et al.

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Dear Toru, thank you very much for your constructive comments and thorough edits. We are very pleased to hear that you agree with our approach and interpretations! Please find a brief discussion of your comment regarding the changes in beach-ridge progradation rate below (see below). All minor corrections have been incorporated into the revised version of the manuscript.

Comment (Tamura): *I agree with all the arguments in the paper and raise only one discussion point to be added (though not mandatory); at present the changes in the progradation rate (as defined in Fig. 3) are attributed to external forcing, such as wave*

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climates and sea-ice cover that are unknown, but some changes in the Makhchar system appear to be relevant with the changing compartment size in association with the beach progradation (e.g., around 1400 BCE and 700 CE). Although further discussion should be given elsewhere, this correlation is worth mentioning here as it may provide additional confidence with the radiocarbon chronology.

Reply (Authors): This is an interesting point and a very well observed detail! However, I am afraid, we are not able to respond to this in a conclusive fashion. In summer 2018, we conducted georadar surveys both in the lagoon (50Mhz) and on the beach-ridge system (250Mhz) in order to resolve information on the internal architecture of the beach deposits and to detect bedrock contacts – both with limited success, likely associated with the lithology of the beach clasts and local bedrock. In consequence, we possess no knowledge as to the deposited volumes. In the manuscript text, we only provided a progradation rate for the inner parts of the BY and MA systems, where the shape of the valley least influenced the availability of accommodation space. At the point in time you mention above, the compartment size at MA changes dramatically, which must have influenced deposition and, as you suggest, may have prematurely reduced progradation rates. This landscape feedback locally masks the effect of climate and sediment supply, and is an unfortunate coincidence and a good example of a limitation in beach-ridge research. Buor Khaya Bay features at least three more beach-ridge sites, that are worth investigating and we hope that, by future studies, these local effects will eventually even out. With this present study, we have the chronological toolbox in place to be able to potentially resolve these details. We hope to be able to return to the area in the near future and would be happy to discuss the results with the community. Thank you very much for your comment!

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