

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

**Toru Tamura (Referee)**

toru.tamura@aist.go.jp

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The Short Communication paper by Sander et al. reports a thorough study of radiocarbon ages of drift wood buried in two arctic prograded beach-ridge plains (Bys Tasa and Makhchar) and dendrochronology of drift wood on their modern beaches. Key findings of this paper include 1) the residence time of drift wood from erosion to final deposition is typically decades long, consistent with previous estimates, and within uncertainties of state-of-art radiocarbon dating, 2) up to ~300 tree rings are observed in drift wood, and 3) the radiocarbon ages of the outermost tree rings in individual samples define very consistent sequences with no age reversal in terms of the morpho-stratigraphy of the beach ridge (i.e., ridges are younger seawards). These findings are well-supported by the data and provide important insights into the radiocarbon chronology in such

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settings: radiocarbon ages of drift wood, if the outermost tree rings are dated, are accurate enough to provide reliable chronology of prograded beach ridges, while if the position of the dated sample is not clear it may introduce overestimate up to a few thousand years. 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 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. Minor corrections L22: transport duration or duration of transport? L37: New paragraph from 'Age control' L81: or 'have been positive over' L87: Fig. 1, Top right L122: 'and', not 'an'? Table 2: MA-4 to MA-26 may be tagged as Set 9. L141: 'conceptually' may be deleted L161-2: or 'hence minimizing reworking or erosion' L164: MA initiated around L224: crucial for understanding the mesoscale

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