

## Review of “Grounding and Calving Cycle of Mertz Ice Tongue Revealed by Shallow Mertz Bank” by Wang et al. in The Cryosphere

Line-by-line comments:

line 29: Replace “The calving of MIT can be cyclical because...” with “In the calving induced by iceberg collisions, our observations suggest that calving of the MIT is a cyclical process controlled by the presence...”

line 40: Change “... Mertz polynya, and sea-ice production and dense, shelf-water formation” to “...Mertz polynya, sea ice production, and dense shelf water formation...”

line 47: Change “how severe the grounding was” to something like “the extent of grounding” or possibly even “the severity of grounding”

line 60-61: This is a somewhat odd sentence “Grounding as a potential factor can affect the stability of an ice tongue...”. I would suggest that you revise and rephrase to indicate how grounding can affect ice tongue stability, not just state that it can influence stability.

line 77: “launched” not “lunched”

line 130: Change to “The first step involves data processing...”

lines 134-135: “... are corrected following the procedures in Wang et al. (2012, 2013).”

line 137: If I’m interpreting this correctly, change to “... to obtain estimates of the instantaneous sea surface height.” You talk about extracting sea surface elevations in the next paragraph, however, so I’m not sure that’s what you mean here.

line 139: How are the data prepared for use?

line 150: What do you mean by “almost repeatedly”?

line 156: “For example, consider ICESat data from...”

line 158: “... distance between track T165 and T31 is ~7.5 km without accounting for ice advection between observation dates.”

line 170: Remove “a little”

line 184: Replace “because of known ice tongue outlines from Landsat images” to “when the ice tongue outline can be delineated from Landsat images”

line 186: “... assuming hydrostatic equilibrium and using the lowest sea-surface height (further discussed in section 6.2.2), which is extracted from ICESat/GLAS data...”

line 201: Remove “at”

line 209: You don’t need to define Edif here since you just defined it before the equation but you need to define Esf (which I assume is the sea floor elevation).

line 213-214: The author’s name is “van den Broeke”

line 228: “that will influence the density of the ice tongue” rather than “that makes ice mass calculation complicated”

line 311: “compared with interpolated freeboard estimates”

line 325: Add a reference for the inter-campaign uncertainty in ICESat data

line 372: I recommend changing “was grounded more significantly” to “became more firmly grounded” because you aren’t performing any statistical tests.

lines 399-400: Remove one of the “over this period”

line 411: End line 410 with a period after the reference then start a new sentence explaining that, based on your observations, you think only one large calving event occurred. (“Based on the interactions between the Mertz ice tongue and Mertz Bank

suggested by our observations and described below, it is likely that only one large calving event occurred between 1912-29156.”)

line 425: “Because of the continuous advection of ice from upstream and the fixed location of the shallow Mertz Bank, the calving is...”

line 434: Of “the” Mertz polynya.

line 439-441: Why would a shorter ice tongue lead to a reduction in katabatic winds (which are driven by air temperature and pressure gradients over steep grounded ice) and polynya size? Elaborate.

line 443: “Mertz wellwhich”?

lines 512-514: I’m not sure I follow this. Why does the absence of shadowing (of ice, the ocean, ???) indicate flotation?

Figure 3: Change the color and/or relative position of the dashed-dotted line so that it is easier to discern.