The Cryosphere Discussions

The Cryosphere Discuss., referee comment RC2
https://doi.org/10.5194/tc-2021-331-RC2, 2021

Comment on tc-2021-331

Anonymous Referee #2

Referee comment on "Improving model-satellite comparisons of sea ice melt onset with a satellite simulator" by Abigail Smith et al., The Cryosphere Discuss., https://doi.org/10.5194/tc-2021-331-RC2, 2021

Review of "Improving model-satellite comparisons of sea ice melt onset with a satellite simulator"

This paper describes a novel use of model simulated brightness temperatures to compute a new metric to identify the timing of earliest snowmelt on Arctic sea ice. The paper compares the simulated brightness temperatures and earliest snowmelt dates with brightness temperatures and a melt onset data set from satellite data.

The paper is well written, and the study is clearly presented. I agree with comments from the prior reviewer and recommend that this paper is published pending a few additional clarifications as described in my comments below.

L61: Why was 2003 selected as the sample year? Is it representative of a normal (non-anomalous) melt onset year? Or something else?

L73: Why is the Steele et al. 2019 dataset used instead of the Markus melt onset product directly? Are they not the same data?

L206-207: To what extent do you think error in the observations or in the simulated brightness temperature contribute to the divergence between the simulated and observed brightness temperatures in the central Arctic (i.e, Figure 3d) seen after the SIC declines? What might the physical reason for this big difference be?

L288: Please add proper names for the geographic locations that are considered "inflow

regions”.