

The Cryosphere Discuss., referee comment RC1
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Reviewer Comment

Anonymous Referee #1

Referee comment on "Two decades of dynamic change and progressive destabilization on the Thwaites Eastern Ice Shelf" by Karen E. Alley et al., The Cryosphere Discuss., <https://doi.org/10.5194/tc-2021-76-RC1>, 2021

This manuscript by Alley and others reports on the evolution of the Thwaites Eastern Ice Shelf over the past 20 years. They use an impressive suite of remotely sensed observations to show its transition from a flow regime largely controlled by the faster flowing Thwaites Ice Tongue, to a largely independent regime following the near complete loss and structural weakening of the Thwaites Ice Tongue around 2007. Importantly they also show the evolution of the TEIS after its decoupling with the Thwaites Ice Tongue and show a progressive weakening in the shear zone near its pinning point and a clear divergence in flow, which is essentially ripping the ice shelf apart. On the basis of these observations the authors hypothesize three potential routes to further destabilization of the TEIS over the timescale of years to a couple of decades. These are important conclusions given the importance of the TEIS in providing buttressing to the Thwaites Glacier.

This is a very impressive manuscript and I found it an enjoyable read. The manuscript is packed with excellent detail, it is well illustrated and I found it very easy to follow. The discussion and conclusions are appropriate given the results presented. I recommend publication as is.