Generally I found the paper very well written with a high level of details. As I am currently working on a similar study, I read the discussion paper with great interest. However, I trapped over the sentence given on Page 15 Line 4-6:

> *After accurately replicating the observed velocity response to large calving events in 2010 and 2012, we were confident in the model's ability to predict the future response of Petermann Glacier to further perturbations of the ice tongue.*

I have some concerns with this statement and miss a deeper discussion about the drawback of the model approach (e.g. no geometric adjustment). I think these points should be addressed with more detail:

1) As already pointed out by the Review of E. Enderlin, your approach lacks the adjustment of glacier geometry. This should be deeper discussed with respect to grounding line flux and speed-up. For instance, your pre-2010 grounding line flux of 10 Gt a-1 fits well with Rignot and Steffen (2008). They provide a grounding line flux of 12 Gt a-1 for the pre-2010 calving state. Other than given in your manuscript (Page13 Line1) the Wilson et al. (2017) flux of 10.8 Gt a^-1 refers to the post-2010 calving state (they calculated it as a mean for 2011-2015). So this is not in accordance with the value of 21 Gt a^-1 (Page14 Line10) for your 2010-post calving state. Also, I am wondering how do you get a doubling of grounding line flux from 2010 to 2012 as the ice thickness at the grounding line does not change (due to your model approach) and the speed-up at the grounding line is only minor (Page14 Line5) as PG was dynamically insensitive (Page16 Line 13). Within my model, I only get an increase of the grounding line flux of approx. 1 Gt a^-1 (that is 10%; from 10.78 Gt a^-1 to 11.86 Gt a^-1) if I manually impose a speed-up of 10% to the remotely sensed velocities.

2) The inversion inferred rheology refers to the pre-2010 calving event and aims to mimic stiff and soft zones across the floating tongue. At short timescales it might be valid to keep this field unchanged but on longer timescales (the whole period of your calving events are on decadal timescales, I guess) it is expected that the field changes due to new developing features. The treatment of rheology and impact on results should be at least discussed thoroughly.

Technicalities:

Page4 Line13: Please rewrite, so far we do not have an operating ice thickness radar from satellite for earth observations.

Fig. 2: I am wondering why the velocity profiles for the initial, pre- and pos-2010 (and 2012) events all terminate at the same distance. For instance, after the 2010 event the purple velocity profile should terminate 15 to 20 km earlier than the initially modelled velocities.