Using idealised 2D ice sheet simulations this paper assess the influence of 2 parameters of the ice constitutive relation that is used in most ice flow models, the Glen flow law. The parameters are the activation energy, Q, and the Glen exponent, n, the pre-exponential factor is adapted to insure consistency between different values of Q and n.

I have several major comments.

First the experimental design is really poorly described and I found very difficult to understand what is really done ; e.g. :

- For the equilibrium state we don't know how the accumulation rate is « adapted » to keep the volume of the ice sheet close to the reference. How close ?
- We understand only in the results section that there is no melting only accumulation.
- Results are presented for several durations (100 years, 2000 years and 10 000 years)

It would be very beneficial to have a clear description of the set-up and experimental design.

Second, as already noted by the first reviewer, the introduction ignores the contributions of several groups to the understanding of the ice rheology. We understand that a review paper by the same first author has been submitted ; however, as this paper is not yet published, the authors should give a better review of previous works to motivate their contribution.

Finally, the flow law that is used here, is certainly the relationship that is used in most ice flow models but I don't think that we can say that it « has so far been assumed certain ». Many models have tested the sensitivity of the models, in different context, to some aspects of the flow law, the enhancement factor (e.g. Ritz et al. 1996, Quiquet, et al. 2018), the initial thermal regime (e.g. Seroussi et al. 2013), the initial viscosity (e.g. Nias et al. 2016, Humbert et al. 2005), the flow law (e.g. Peltier et al., 2000, Pettit and Waddington, 2003, Ma et al., 2010). And there is also a many applications and papers describing anisotropic ice flow models. It is true that this aspect has not been too much explored or discussed in the last community efforts to assess the contribution of the ice sheet to sea level rise. However, the idealised experiment presented here is very simple and it is not clear on which relevant time scales this uncertainty should be taken into account. The results presented in this paper show ice losses of 300 Gt in 1000 years ; this value is the order of magnitude of what is lost by the Greenland ice sheet in one year ; So should we really take into account this uncertainty in sea level rise projections ? Seroussi et al. (2013) have shown that 100 years simulations of the Greenland ice sheet are weekly sensitive to small changes in the initial thermal regime compared to other sources of uncertainty. On the other hand, for longer time scales, the sensitivity of the model results to the ice flow law as already been explored by several authors (see above) for real ice-sheet simulations. In conclusion I found that this simple experiment add very little to existing literature.

In conclusion, I encourage the authors to improve their discussion on previous works to motivate their contribution and run more realistic experiments to better assess the magnitude and time scales relevant for this source of uncertainty.

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