

We thank the reviewer for their comments. We agree with their comments and have changed the manuscript accordingly. Please see below for the detailed response. Additionally, we have changed the supplement text, so the figures read S1, S2 etc. as requested in the file validation process.

### # Main Comments

- One of the main findings of this manuscript is that the numerical model parameters can significantly impact the results in the case without pinning point, which serves as a crucial warning to the modeling community. I suggest the authors rewrite the abstract to better highlight this finding.

We have added a sentence to the abstract to cover the point the reviewer suggests.

### # Detail

- l62-64, list the names of the numerical model parameters considered in the manuscript

We have added a sentence outlining the numerical model parameters.

- l141, affect → effect Changed

- l148-149, how many degrees of freedom do you have in this case? and how many time steps? These will give the readers a rough idea about what '45 minutes' means. Change 'uniformly' to 'linearly'.

We have added in the maximum DOFs (Stokes solver has the highest DOFs) which is 35,980 (4\*number of nodes) for the final domain. Note the DOFs change after remeshing so we have reported the final domain. The number of timesteps for the control of 106 (100 day timestep plus six adaptively added) has also been included.

- l149, exponentially sounds really bad in terms of scaling in numerical method. Do you mean 'cubically' or 'quadratically'? or something else

We meant cubically as the reviewer points out.

- l173, 'direction of the fjord wall', is this the normal direction? or tangent? Note that the fjord wall is a 2D surface in 3D.

Tangential direction. This has been added. We have added a sentence specifying that the fjord walls are only represented in the x and y plane rather than a 2D surface.

- l279, 'The convergence of the velocity solution' (ln 256) Changed

- l288, it is unclear what 'inadequate flow solution' is in reason 1)

'Inadequate flow solution' has been changed to 'non-converged or unrealistic flow solution'.

- l287-290, the two reasons are both to reduce the time step. How to adaptively increase dt is not mentioned.

The timestep is only adaptively reduced to assess the potential for a calving cascade or because of an issue requiring remeshing. If these conditions are not met normal time stepping is resumed. We have added a sentence to provide additional clarity.

- l327, to choose Changed

- l353,  $n^2$  to  $n^4$  is quadratic to quartic, not exponentially. And, you don't want to have exponential growth of computational cost in general

We meant cubically as the reviewer points out.

- Appendix A, the words in the equations (A1)-(A7) should be in normal font, not italic

Changed