Author's final comments (continuation)

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T. Dunse: *"Do the authors have acquired the permissions to reprint figures 1 and 2? The resolution of these figures could be better. Maybe the location of the ice core could be indicated in figure 1?"*

The authors acquired the permission to reprint the figures yet for publication of the manuscript in 2012 (Konovalov, 2012). Prof. J. A. Dowdeswell have kindly permitted me to use the figures of (Dowdeswell et al., 2002) in my manuscripts. I reprinted the figures that were available as open access supplementary materials to the manuscript Dowdeswell et al., 2002. Thus, the available quality/resolution was provided by the publisher.

T. Dunse: *"The model description is insufficient. The authors do for example not mention that their employed model is a higher order model – or is it full stokes/SIA? Additional components, such as the calving model are barely described at all."*
Anonymous Referee #2: "*The authors say they include a rectangular ice shelf geometry, presumably thisis rectangular in the x–y? If buttressing is to be included in this flow line model – and it is not clear to me at all how this is done, as ice shelves can generally beexcluded in flow line models (e.g., Schoof, 2007) – then these shelves should be able to evolve according to a MacAyeal type model (MacAyeal, 1989) and both a calving law and the force balance at the calving front have to be considered. If buttressing is included through some parameterization, then those details need to be given as well. The case of buttressing also ties back to the argument made above about the applicability of the model: buttressing is an important factor in stabilizing grounding line motion and calculating the force balance of a tidewater glacier, hence those missing physics could substantially change the results of the paper."*

We suppose that the calving processes at long-time scales can be described by a stochastic model, which considers the size of the debris as a random value. And this value satisfies a probability distribution law, for instance, likewise the Gaussian distribution.
In fact, we considered the simplest probability distribution, i.e. when the debris of equal length occur at each calving. Thus, the length of ice debris is the parameter, which, in particular, corresponds the average length in a probability distribution law.
Moreover, in this model the both ice-shelf length and ice-shelf thickness at the terminus are considered as the variables that should satisfy a certain conditions. If the ice-shelf length exceeds a value l_{cr} (the parameter of the model) or the ice-shelf thickness beside the terminus becomes smaller than a value H_{cr}, then the calving of the appropriate part of ice occurs in the model.
To investigate the impact of the parameters on the results of the modeling, the parameters were varied in a series of the experiments. However, the simulation reveals that at long-time scales the mass balance, friction coefficient, ice temperature have the main impact to the assessment of the grounding line retreat derived by the modeling.

Anonymous Referee #2: *"Fig. 6b and 6c show an increase in basal friction after 30 km – what do the authors think is the origin of this peak?"*

Possibly, the water content in the bedrock/till layer varies with the bed elevation changes, and the enhancement of water content at lower elevations provides a decrease in the friction coefficient in the corresponding areas (i.e. viscosity of the till layer depends on the water content). Another suggestion is that the variations in basal friction are provided by the variations in the till layer thickness.

Anonymous Referee #2: *"There are a number of oddly constructed sentences and incorrectly used words, and the manuscript should be edited by a native speaker to be acceptable for publication."*

Possibly, the Copernicus editors can help as and can correct the sentences and the words. As we understand the editor should well know the theme/problem discussed in the manuscript. If you know the native English speaker editor, it would be nice to write (for instance, somewhere on the web pages of the journal) the website address of the editor… Then authors that know about their problems with English, will send manuscripts to the editor before the submissions to the journals.

Thanks and all the best,

Yuri V. K.