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Grounding line history as an indicator of paleoclimatic changes

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The grounding line histories and the outgoing ice flux histories were obtained in 2D ice flow line model (Pattyn, 2000) for the ice streams in the Academy of Sciences Ice Cap in the Komsomolets Island, Severnaya Zemlya archipelago (Dowdeswell et al., 2002). The modelled histories were obtained for the harmonic climatic impact to the ice streams, which implies the harmonic changes in the time of the reference mass balance (Bassford et al., 2006) and the corresponding harmonic ice surface temperature changes that in the model occur in antiphase to the mass balance changes.
The aim of this work is to find the possible relationship between the histories (i) of modelled grounding line position and (ii) of input air temperature. This possible relationship can be expressed by the equation, which takes into account the time lag between the histories. Such equation was considered in the similar problem, in which the relationship between the history of the total extent of glaciers and the air temperature history, was investigated (Oerlemans, 2005). For harmonic air temperature histories the relationship was investigated in (Konovalov, Nagornov, 2009).
Moreover, the modelled outgoing ice flux history also relies on the climate impact history. Thus, it's supposed, that the equation, which considers the time lag between the histories, and in which the air temperature is considered as the governing function, can be used for assessment of the changes of outgoing ice fluxes from outlet glaciers and ice streams in suggested future climate scenarios.

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