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## Sensitivity studies on model modifications to assess the dynamics of the temperate ice cap of King George Island, Antarctica and comparison with in-situ measurements

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In ice sheet dynamics, cold and usually extended ice sheets (temperatures below pressure melting point) with negligible amounts of water that does not affect the ice dynamics are distinguished from smaller and temperate ice caps (temperatures at pressure melting point) where water is percolating through the ice matrix. The present study focuses on King George Island (=KGI), the largest of the South Shetland Islands, which is located north of the Antarctic Peninsula at  $62^{\circ}$  S. It is largely governed by maritime climate conditions. The overlying ice cap consists of a mainly temperate ice body with a significant amount of water affecting the ice dynamics in a non-negligible way. This fact has to be considered while adapting a 3-D numerical flow model to obtain the ice dynamics of this ice body. Therefore, we apply and modify the approach of Greve et al. (1998) in order to integrate the water content in the ice cap into the model equations. By means of a sensitivity study, the effect of the considered water content as well as additional modifications to the higher-order model affecting Glen's flow law (namely the Arrhenius factor and the so-called enhancement factor) on the resulting flow dynamics are presented. Furthermore, we will compare these numerical results with recent in-situ stake-measurements obtained from a field campaign during austral summer 2004/2005.