Supplement of The Cryosphere, 18, 187–203, 2024
https://doi.org/10.5194/tc-18-187-2024-supplement

The Cryosphere Open Access EGU

Supplement of

Impact of shallow sills on circulation regimes and submarine melting in glacial fjords

Weiyang Bao and Carlos Moffat

Correspondence to: Weiyang Bao (wbao@udel.edu)

1 Supplementary Figures

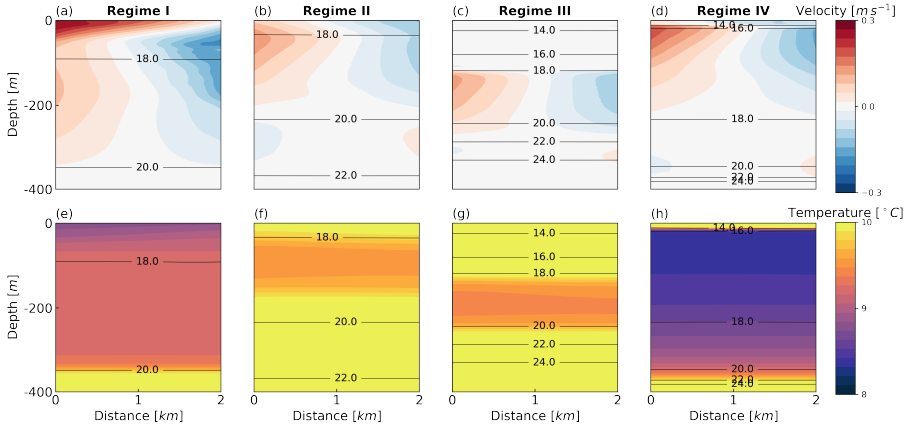

Figure S1. Snapshots of along-fjord circulation (top) and temperature (bottom) regimes viewed at cross-section S1. Black contours denote water density anomaly, positive values of velocity represent down-fjord currents.

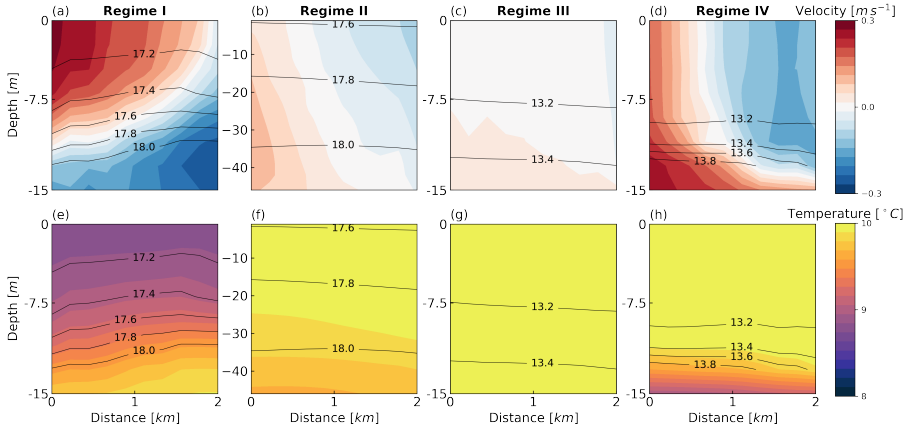

Figure S2. Snapshots of along-fjord circulation (top) and temperature (bottom) regimes viewed at the cross-fjord section above the sill. Black contours denote water density anomaly, positive values of velocity represent down-fjord currents.

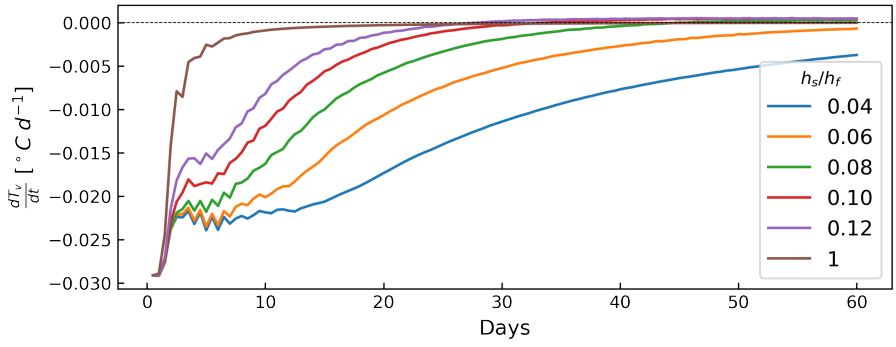

Figure S3. Heat storage change of the control volume bonded by the glacier front and the cross-fjord section S1. T_v is the temperature of the control volume.

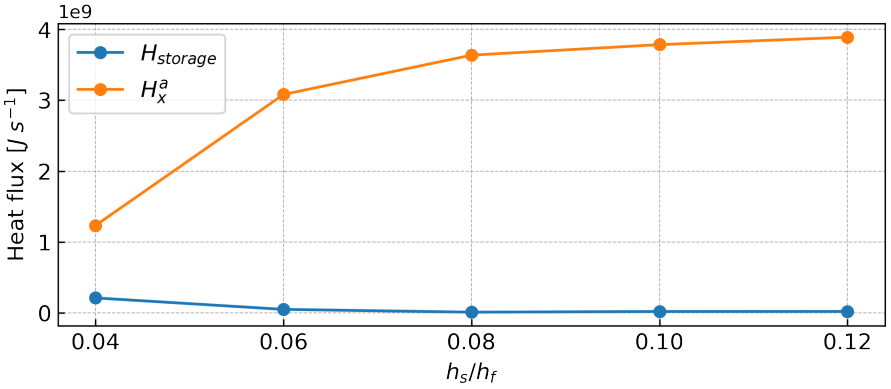

Figure S4. Heat storage ($H_{storage}$) vs. horizontal heat transport divergence (H_x^a) for the control volume bonded by the glacier front and the cross-fjord section S1 in the base case. Results are averaged over the last 14 days of simulations.

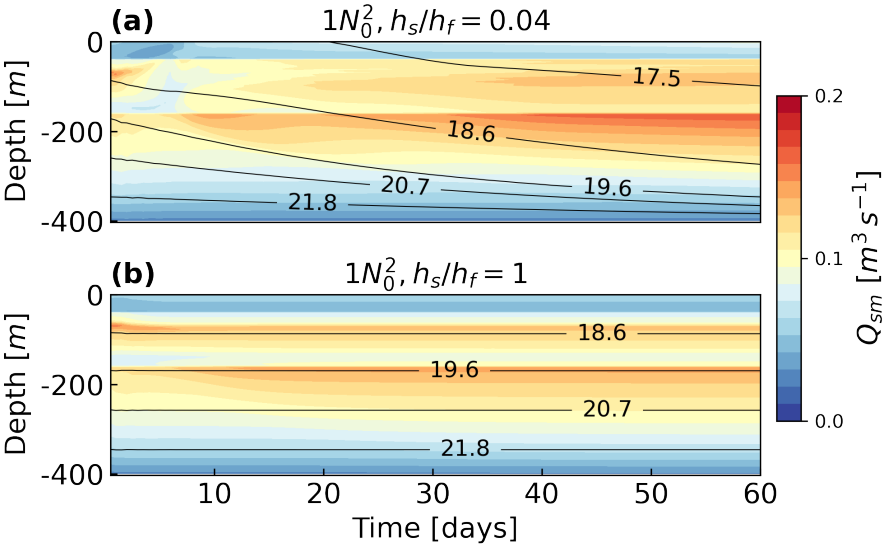

Figure S5. The evolution of submarine melting with (a) and without (b) a sill. Forcing and initial conditions other than the sill depth are the same.

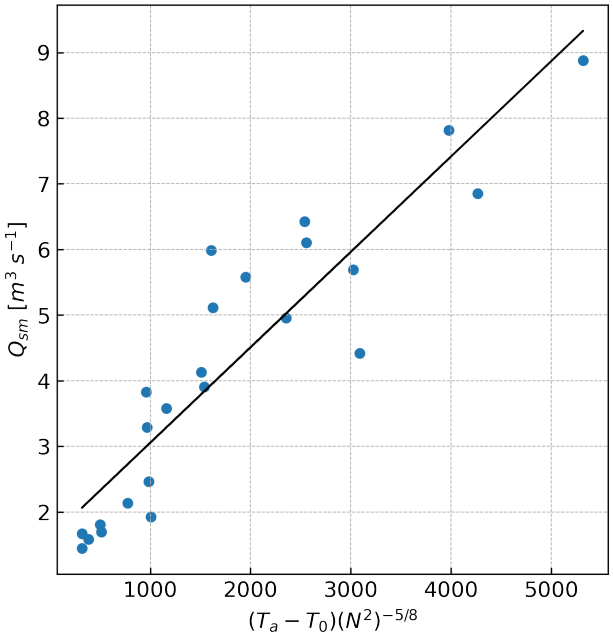

Figure S6. Dependency of Q_{sm} on combined fjord conditions ($(T_a - T_0)(N^2)^{-5/8}$) from model outputs. Results are averaged over the last 14 days of simulations. The solid black line is the linear regression with a slope of $k = 1.45 \times 10^{-3}$.

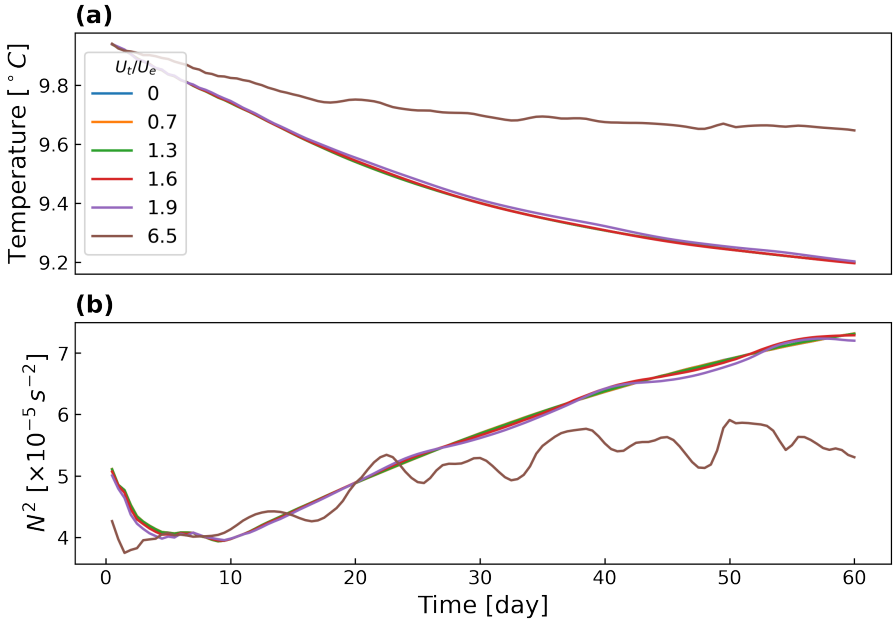

Figure S7. The evolution of depth-averaged temperature (a) and stratification (b) near the glacier with varying tidal forcing (U_t/U_e).