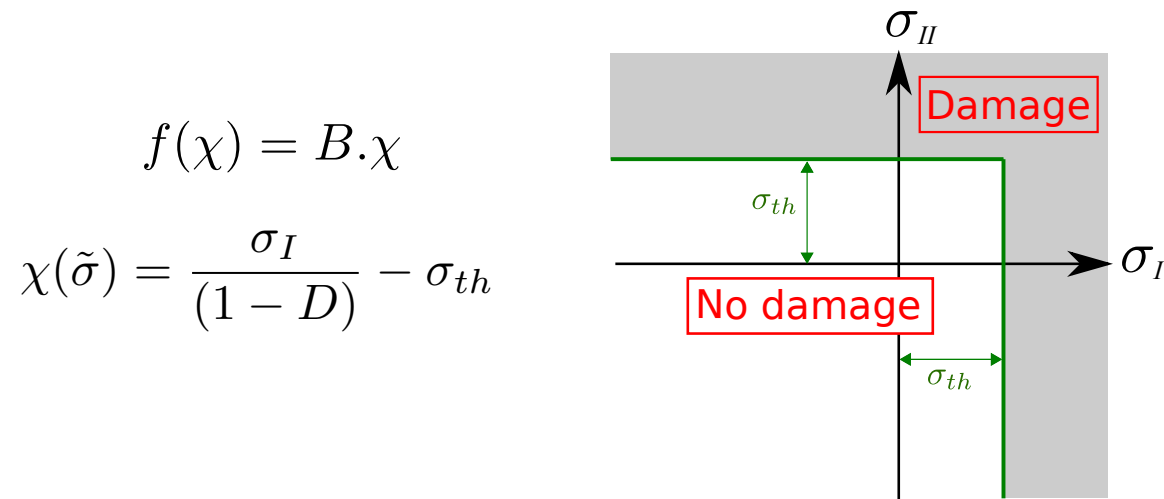


Calving framework

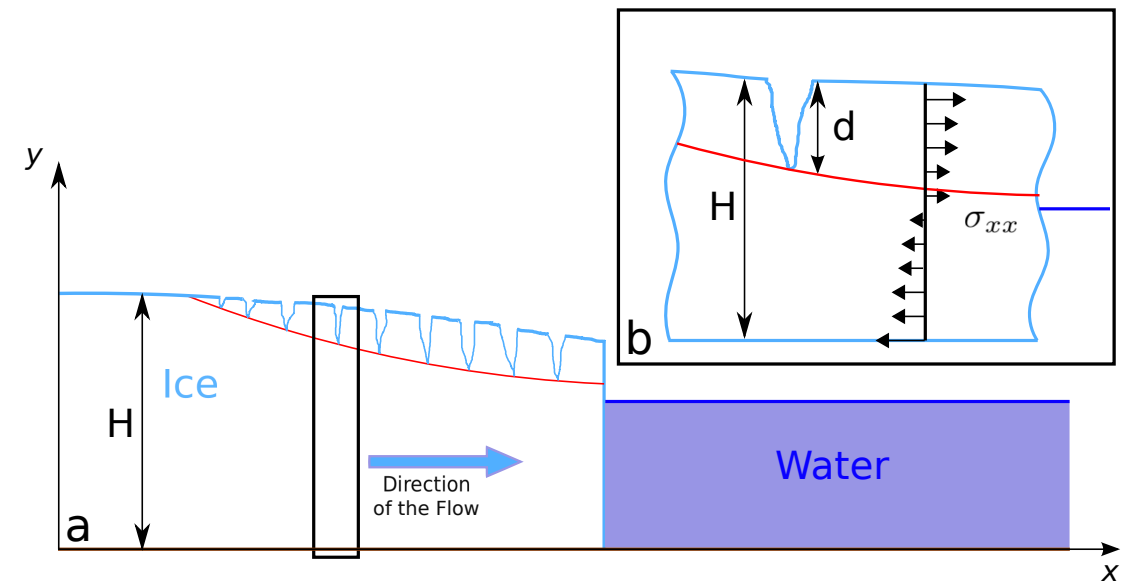
USF_Damage.f90

CalvingSolver.f90

Damage source «f» depends on the first principal stresses



Crevasse propagation is initiated at depth «d» if LEFM criterion is fulfilled...



Damage modifies the ice rheology in the Glen's flow law through the enhancement factor

$$\mu = E \cdot f(\sigma) \quad E = \frac{1}{(1-D)^n}$$

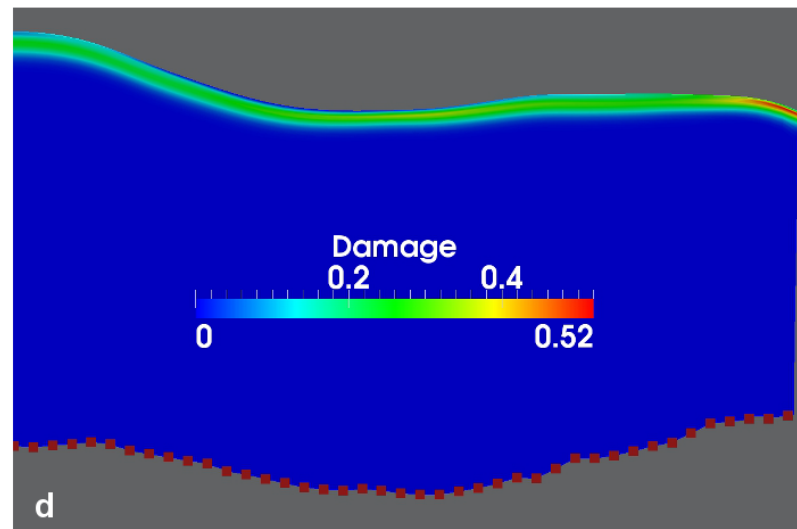
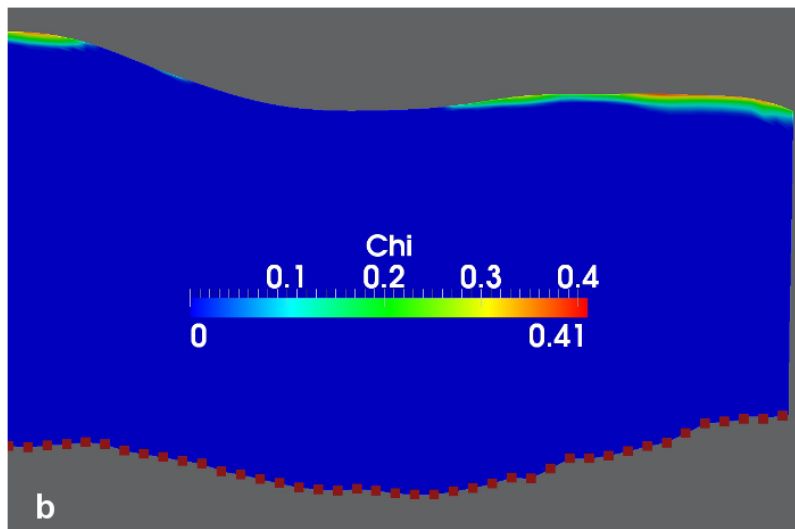
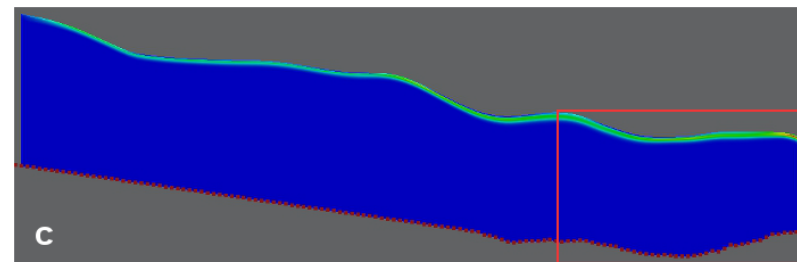
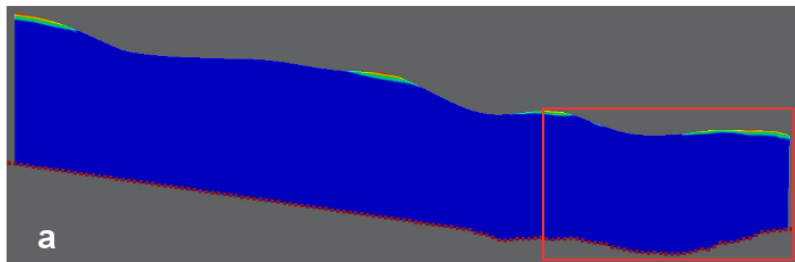
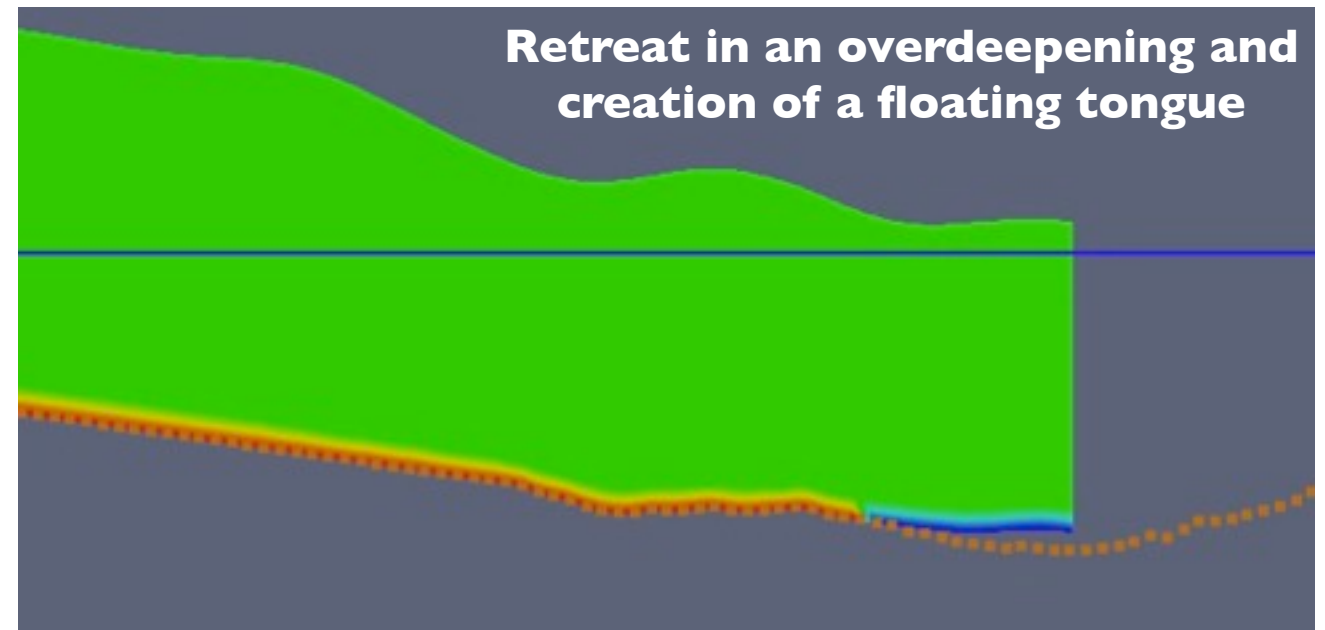
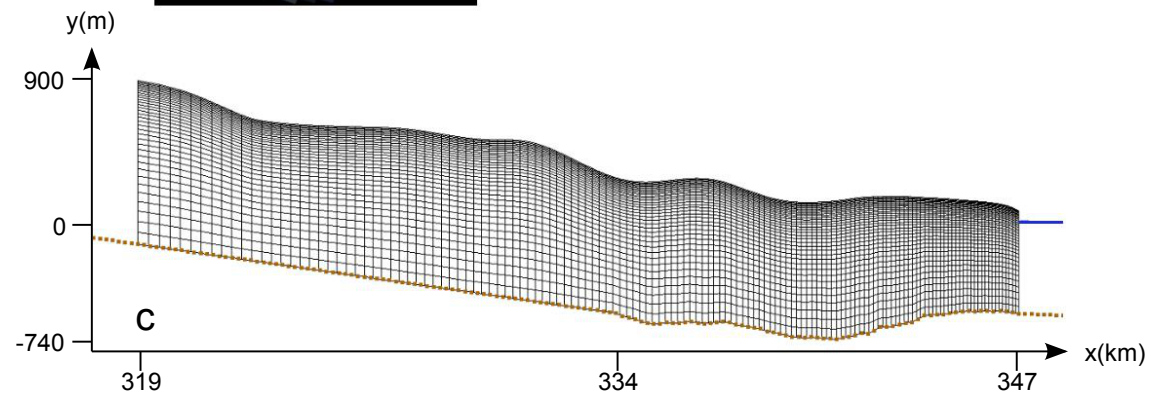
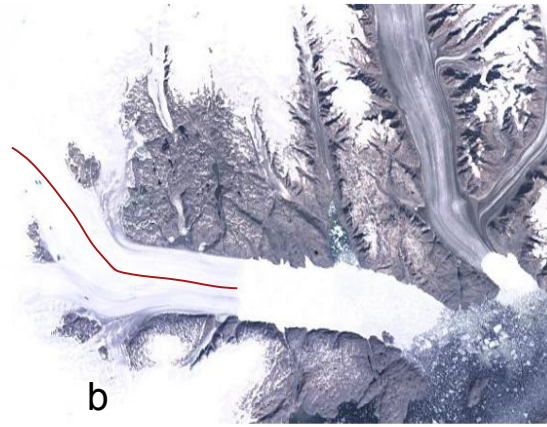
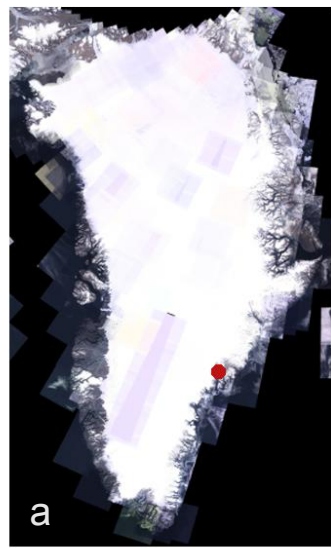
$$K_I = \sigma_{xx} \sqrt{\pi d} > K_{Ic}$$

... and again at sea level ...

$$K_I = \sigma_{xx} \sqrt{\pi d_{sl}} > K_{Ia}$$

Calving occurs

Model validated on a flow-line geometry of Helheim Glacier



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