

Initial state and
initial mesh

Time: $t_0=0$

Stress balance
(velocity field update)

Mass balance
(surface and thickness update)

Time increment: $t_{n+1}=t_n+dt$

Adaptive mesh refinement
(mesh update)

Grounding line migration
(basal friction update)

Ice front migration
(front boundary condition update)

- Calculate elements distance to the grounding line
- Calculate ZZ error estimators
- Refine/coarsen elements
- Adjust solutions on the new mesh