

Example: Deformation of highly viscous liquid

Elmer Basic Course
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Problem Outline

➤ Geometry

- Square with 100 x 20 m
- Free surface

➤ Dynamics:

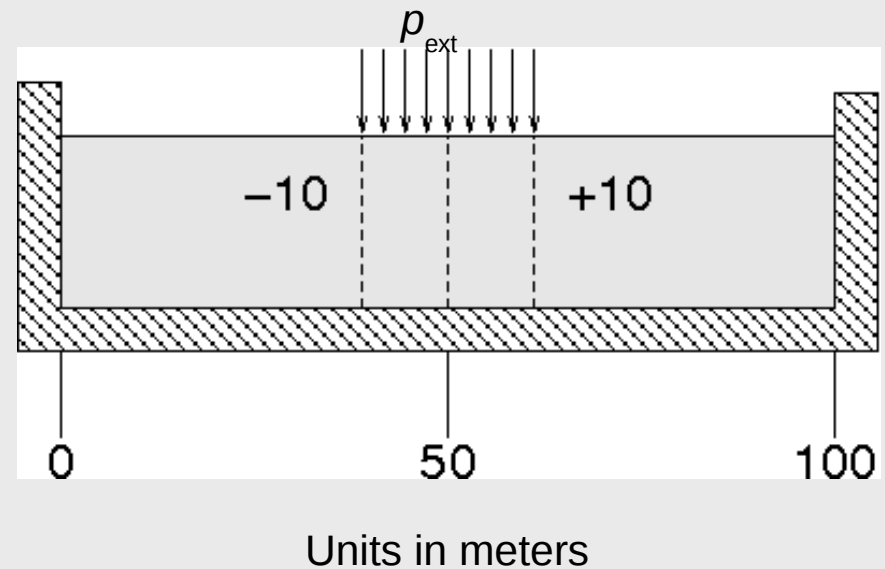
- Constant load ± 10 m around middle
- $p_{\text{ext}} = 1 \text{ MN m}^{-2}$
- Gravity in $-y$

➤ Material (similar to temperate ice):

- $\mu = 10^{14} \text{ kg m}^{-1} \text{ s}^{-1}$
- $\rho = 900 \text{ kg m}^{-3}$

➤ Integration time:

- 4 years in steps of 1 months (48 steps)



Boundary Conditions

➤ Initial Condition

Mesh Update 1/2 = 0

Velocity 1/2/3 = 0

FreeSurf = 20.0

➤ Sidewalls:

Velocity 1 = 0

Velocity 2 = 0

Mesh Update 1 = 0.0

➤ Bottom wall:

Velocity 1/2/3 = 0

Mesh Update 1/2 = 0.0

➤ Free surface:

Body ID = 2

Mesh Update 1 = 0

Mesh Update 2 = Variable FreeSurface

Real MATC "tx - 20.0"

External Pressure = Variable Coordinate 1

Real

```
0.0 0
39.9 0
40 1000000
60.0 1000000
60.1 0
100 0
```

end

