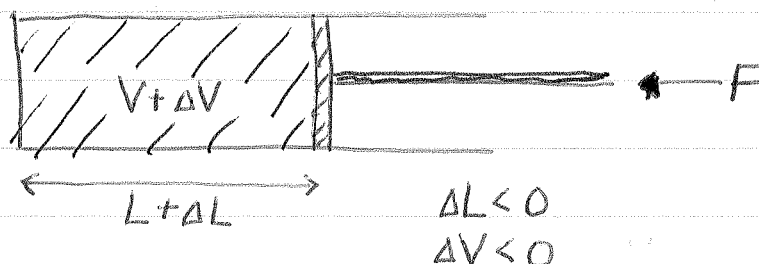
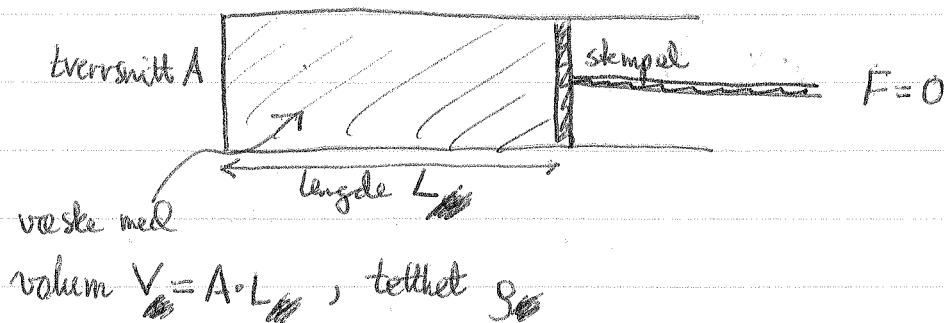


Lydbølger i væsker



$$\frac{F}{A} = -B \frac{\Delta L}{L} = -B \frac{\Delta V}{V} \quad \left(\begin{aligned} \Delta V &= \Delta(A \cdot L) \\ &= A \cdot \Delta L \end{aligned} \right)$$

(spenning = elastisk modul $\cdot$ relativ foryning)

B = bulkmodulen $[N/m^2]$

massen er bevart $\Rightarrow m = \rho \cdot V = \text{konst.} \quad (\rho = m/V)$

$$\Rightarrow \frac{\Delta V}{V} = - \frac{\Delta \rho}{\rho} \quad \left(\frac{\Delta V}{\Delta \rho} = - \frac{m}{\rho^2} = - \frac{V}{\rho} \right)$$

Lydhastighet i væsken: $v = \sqrt{\frac{B}{\rho}}$

Eks: Vann har $B = 2.1 \cdot 10^9 \text{ N/m}^2$ og $\rho = 1000 \text{ kg/m}^3$

$$\Rightarrow v_{\text{H}_2\text{O}} = \sqrt{2.1 \cdot 10^3} \text{ m/s} \approx \underline{1.45 \cdot 10^3 \text{ m/s}}$$