

N2 for massen  $\Delta m$ :

$$\begin{aligned}\Delta m \cdot \ddot{\xi} &= F(x) - F(x+\Delta x) \\ &= [\Delta p(x) - \Delta p(x+\Delta x)] \cdot A \\ &= -B \cdot \left[ \left( \frac{\partial \xi}{\partial x} \right)_x - \left( \frac{\partial \xi}{\partial x} \right)_{x+\Delta x} \right] \cdot A \\ &= B \cdot \frac{\partial^2 \xi}{\partial x^2} \cdot \Delta x \cdot A\end{aligned}$$

$$\Delta m = \rho \cdot A \cdot \Delta x$$

$$\Rightarrow \rho \cdot \ddot{\xi} = B \cdot \frac{\partial^2 \xi}{\partial x^2}$$

Dermed:

$$\boxed{\frac{\partial^2 \xi}{\partial x^2} = \frac{1}{v^2} \frac{\partial^2 \xi}{\partial t^2} \quad \text{med} \quad v = \sqrt{B/\rho}}$$

Eks: Luft:  $\sqrt{1.42 \cdot 10^5 \text{ Pa} / 1.29 \text{ kg/m}^3} = 332 \text{ m/s}$   
Vann:  $\sqrt{2.2 \cdot 10^9 \text{ Pa} / 1000 \text{ kg/m}^3} = 1483 \text{ m/s}$   
Stål:  $\sqrt{2.65 \cdot 10^{11} \text{ Pa} / 7800 \text{ kg/m}^3} = 5832 \text{ m/s}$   $[v = \sqrt{(B + \frac{4}{3}G)/\rho}]$

Hvis tynn stang (fast stoff): E erstatter B

$$\Rightarrow \frac{\partial^2 \xi}{\partial x^2} = \frac{1}{v^2} \frac{\partial^2 \xi}{\partial t^2} \quad \text{med} \quad v = \sqrt{E/\rho}$$

Seismiske bølger:

Både transv. og longit. bølger, såkalte S-bølger ("sekundære") og P-bølger ("primære").

$$v_s = \sqrt{G/\rho}, \quad v_p = \sqrt{(B + 4G/3)/\rho} > v_s$$

$\Rightarrow$  P-bølgene ankommer først ved jordskjelv