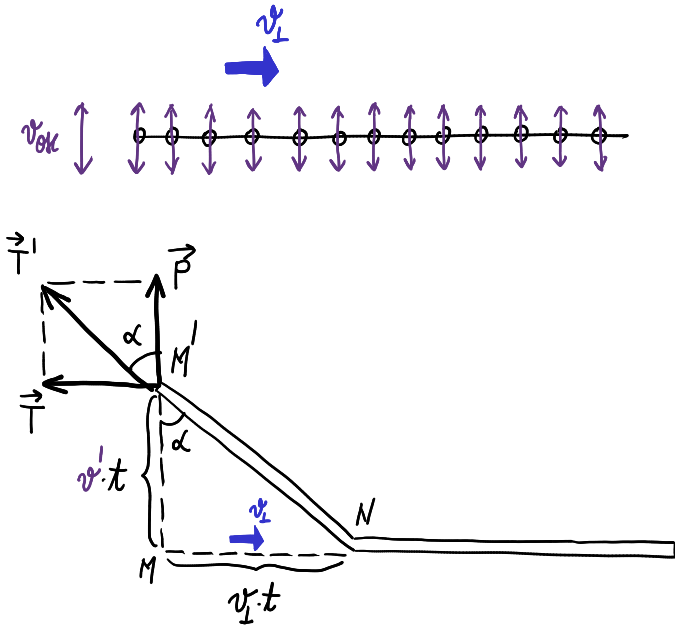


# VITEZA DE PROPAGARE A UNDELOR

## UNDE TRANSVERSALE



$$\tan \alpha = \frac{T}{P} = \frac{v_{\perp}}{v_{\parallel}} \Rightarrow P = T \cdot \frac{v_{\parallel}}{v_{\perp}}$$

$$P \cdot \Delta t = m \cdot \Delta v, \quad \mu = \frac{m}{v_{\perp} \cdot t}$$

$$\Delta v = v' - 0$$

$$\Rightarrow T \frac{v_{\parallel}}{v_{\perp}} \cdot t = \mu \cdot v_{\perp} \cdot t \cdot (v' - 0)$$

$$\boxed{v_{\perp} = \sqrt{\frac{T}{\mu}}}$$

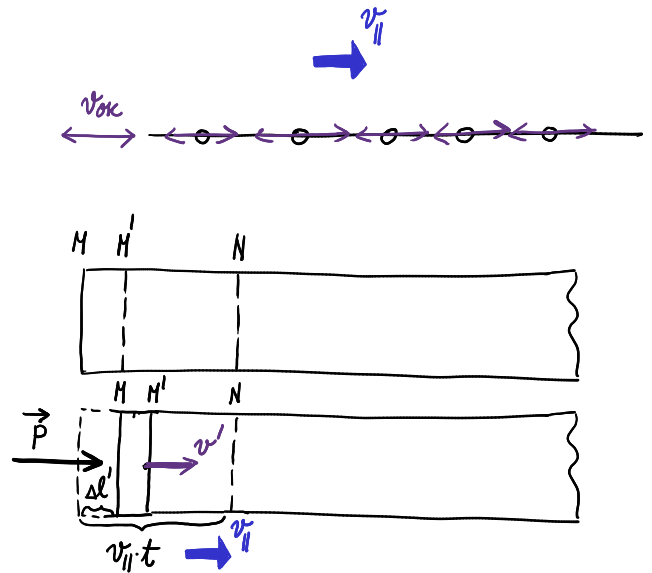
$v_{\perp}$  = viteza undelor transversale

$T$  = forța de tensiune

$\mu$  = masa unității de lungime

$v_{\perp}$  depinde doar de proprietățile mediului

## UNDE LONGITUDINALE



$$\frac{P}{S} = E \cdot \frac{MH'}{MN}$$

$$\frac{P}{S} = E \cdot \frac{\Delta l'}{v_{\parallel} \cdot t}, \quad \rho = \frac{m}{S \cdot \Delta l'}$$

$$\Rightarrow m = \rho \cdot S \cdot \Delta l' = \rho \cdot S \cdot \frac{P \cdot v_{\parallel} \cdot t}{SE} = \frac{\rho \cdot P \cdot v_{\parallel} \cdot t}{E}$$

$$P \cdot t = m \cdot \Delta v$$

$$P \cdot t = \frac{\rho \cdot P \cdot v_{\parallel} \cdot t}{E} \cdot (v' - 0)$$

$$\boxed{v_{\parallel} = \sqrt{\frac{E}{\rho}}}$$

$v$  = viteza undelor longitudinale

$E$  = modulul de elasticitate Young

$\rho$  = densitatea

$v_{\parallel}$  depinde doar de proprietățile mediului