Esercizio 3.7.

$$A = \ell^2 - \alpha^2\ell^2 = \ell^2(1-\alpha^2)$$

$$J_{yy} = J_{xx} = \frac{\ell \cdot \ell^3}{12} - \frac{\alpha\ell \cdot \alpha^3\ell^3}{12} = \frac{\ell^4(1-\alpha^4)}{12}$$

$$W_{xx} = W_{yy} = \frac{\ell^4}{12}(1-\alpha^4)\cdot\frac{2}{\ell} = \frac{\ell^3}{6}(1-\alpha^4)$$

- sforzo normale

$$N_A = F$$

- momento flettente

$$M_{f_A} = F \cdot \lambda\ell$$

$$\sigma_A = \frac{F}{A} + \frac{F\cdot\lambda\ell}{W_{xx}} = \frac{F}{\ell^2}\left(\frac{1}{1-\alpha^2} + \frac{6}{1-\alpha^4}\right)$$

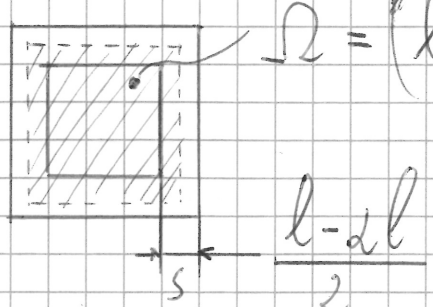
- taglio

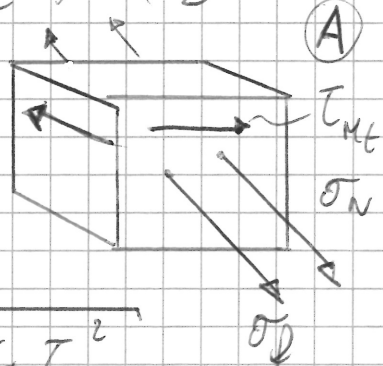
→ in A la τ di taglio è nulla

- τ momento torcente con Bredt

$$\tau_{Mt} = \frac{Mt}{2\Omega s} = \frac{F\cdot\lambda\ell}{2\cdot\left(\frac{\ell+\alpha\ell}{2}\right)^2\cdot\frac{\ell-\alpha\ell}{2}} = \frac{F\cdot\lambda\ell\cdot 4}{\ell^2(1+\alpha)^2\cdot\ell(1-\alpha)} = \frac{F}{\ell^2}\left(\frac{4\lambda}{(1+\alpha)^2(1-\alpha)}\right)$$

$$\Omega = \left(\ell - \frac{\ell-\alpha\ell}{2}\right)\cdot\left(\frac{\ell}{2} + \frac{\alpha\ell}{2}\right) = \left(\frac{\ell+\alpha\ell}{2}\right)^2$$





$$\sigma_{1A} = \frac{\sigma_A}{2} + \sqrt{\left(\frac{\sigma_A}{2}\right)^2 + \tau_{Mt}^2} \quad ; \quad \sigma_{2A} = \frac{\sigma_A}{2} - \sqrt{\left(\frac{\sigma_A}{2}\right)^2 + \tau_{Mt}^2}$$