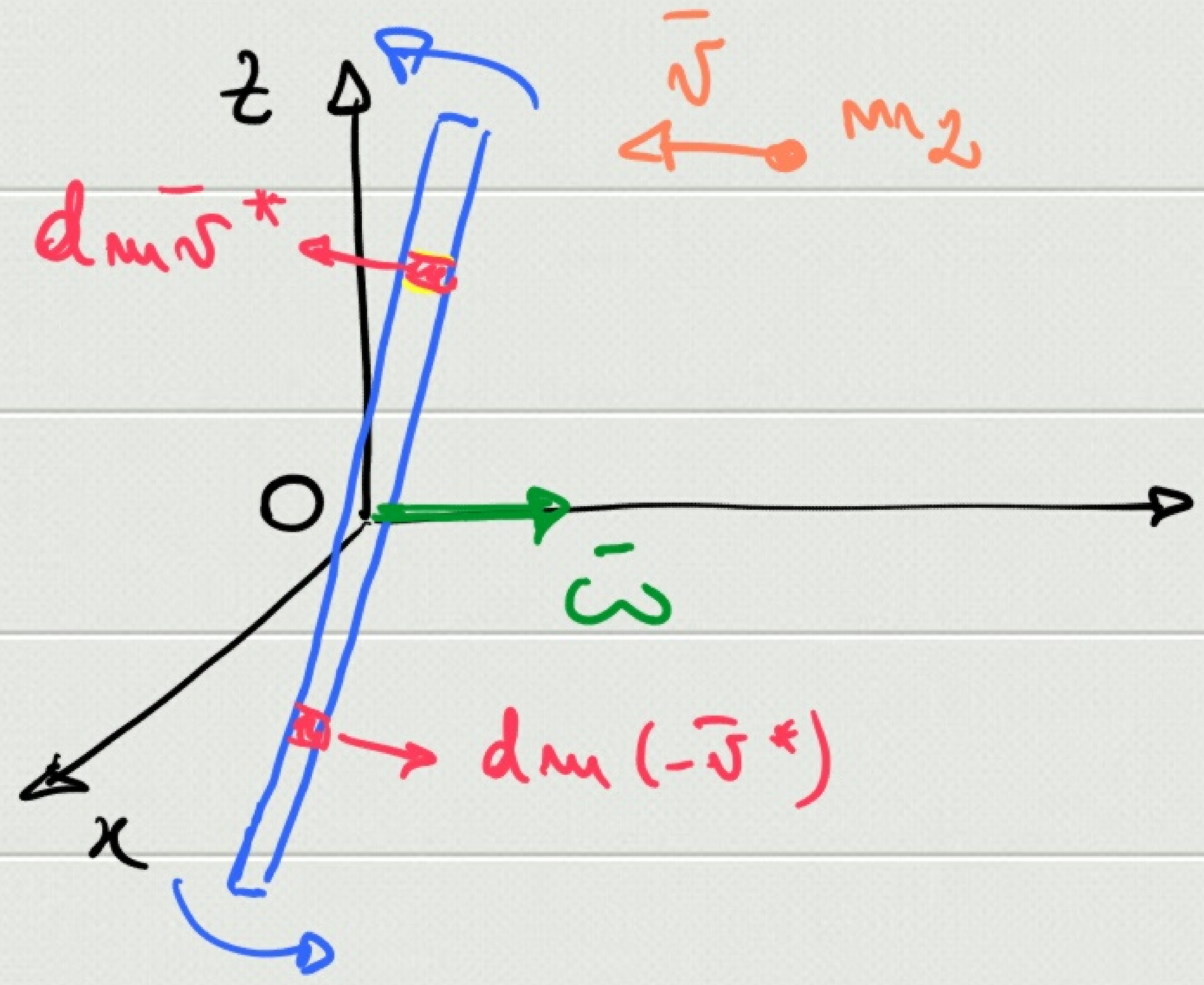


$m_1,\ \ell$

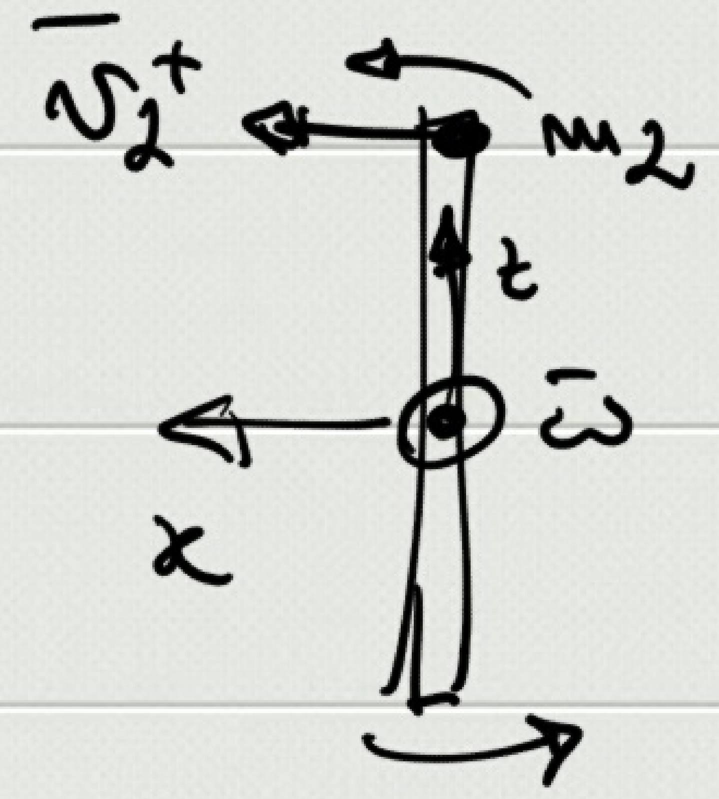
$\bar{v} = v\,(-\bar{u}_y)$

urto compl. anelastico

$$\bar{p}^- = \underbrace{\bar{p}^-_{sbarretta}}_{m_{sb}\,\bar{v}_{cm,sb} = 0} + \overbrace{\bar{p}^-_{m_2}}^{m_2\bar{v}} = m_2\,\bar{v} = m_2\,v\,(-\bar{u}_y)$$

$$\bar{p}^+ = \underbrace{\bar{p}^+_{sb}}_{=0} + \bar{p}^+_{m_2} = m_2\,\bar{v}_2^+ = m_2\,v_2^+\,(\bar{u}_x) =$$

$$= m_2\,\omega'\,\frac{\ell}{2}\,(\bar{u}_x)$$



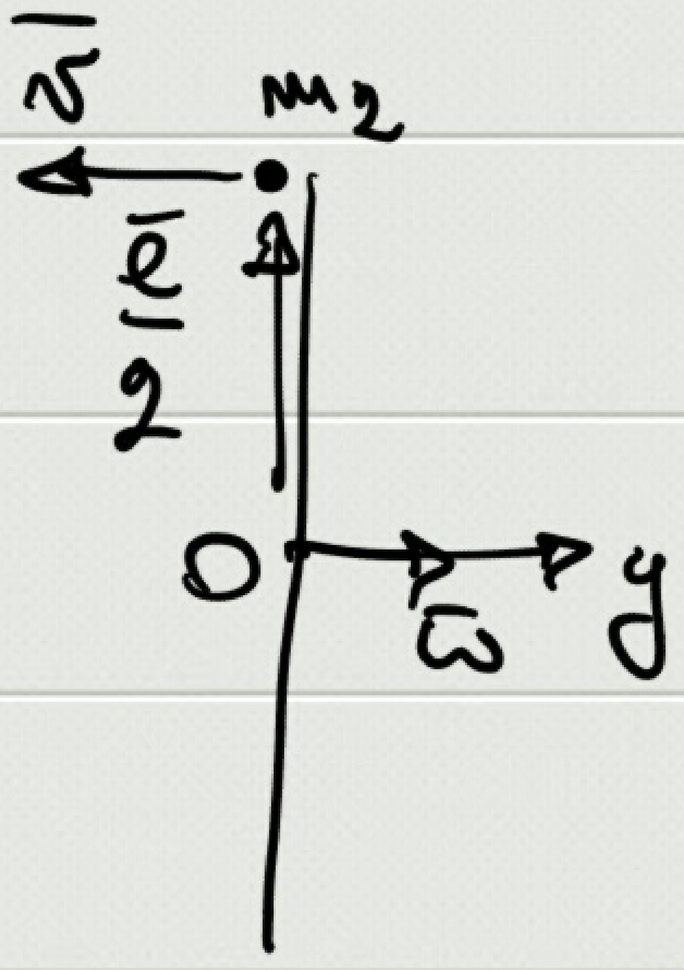
$$\Delta\bar{p} = \bar{p}^+ - \bar{p}^- \neq 0 \qquad \boxed{\bar{p} \neq \text{cost}}$$

$$\bar J = \Delta \bar P = m_2\, \omega' \frac{\ell}{2}\, \bar u_x - m_2 \bar v\, (-\bar u_y) =$$

$$= m_2 \left(\omega' \frac{\ell}{2} \bar u_x + v \bar u_y \right)$$

$$\Rightarrow \quad J = m_2 \sqrt{\left(\omega' \frac{\ell}{2}\right)^2 + v^2}$$

$\bar L_o^-$, $\bar L_o^+$



$$\bar L_o^- = \bar L_{o,sb}^- + \bar L_{o,m_2}^- =$$

$$= \bar I_y \bar\omega + \frac{\bar\ell}{2} \times m_2 \bar v =$$

$$= \underbrace{\frac{1}{12} m_1 \ell^2 \omega\, \bar u_y}_{} + \frac{\ell}{2} m_2 v\, \bar u_x$$

$$\bar L_o^+ = \bar L_{o,sb}^+ + \bar L_{o,m_2}^+ = \qquad \left(= \bar L_{o,sb+m_2}^+ \right)$$

$$\searrow \bar I'_y\, \bar\omega'$$

$$= \bar I_y \bar\omega' + \frac{\bar\ell}{2} \times m_2 \bar v_2^+ =$$

$$= \frac{1}{12} m_1 \ell^2 \bar\omega' + \frac{\ell}{2} m_2\, \omega' \frac{\ell}{2}\, \bar u_y =$$

$$= \underbrace{\frac{\ell^2}{4}\left(\frac{1}{3} m_1 + m_2\right) \omega'\, \bar u_y}_{} \quad \Rightarrow \boxed{\bar L_o \neq cost}$$

$$L_{o,x} \neq \text{cost} \qquad (L_{o,z} \neq \text{cost})$$

$$\boxed{L_{o,y} = \text{cost}}$$

$$\Rightarrow \frac{1}{\cancel{12}_{3}} m_1 \cancel{\ell^2} \omega \bar{u}_y = \frac{\cancel{\ell^2}}{4} \left(\frac{1}{3} m_1 + m_2 \right) \omega' \bar{u}_y$$

$$\Rightarrow \boxed{\omega' = \frac{m_1}{m_1 + 3 m_2} \omega}$$

$$\int \bar{M} \, dt = \Delta \bar{L}$$

$$\Rightarrow \Delta \bar{L}_o = \bar{L}_o^{+} - \bar{L}_o^{-} =$$

$$= \cancel{\left(L_{oy}^{+} \bar{u}_y \right)} - \left(L_{ox}^{-} \bar{u}_x + \cancel{L_{oy}^{-} \bar{u}_y} \right) =$$

$$= - L_{ox}^{-} \bar{u}_x = - \frac{\ell}{2} m_2 v \bar{u}_x$$