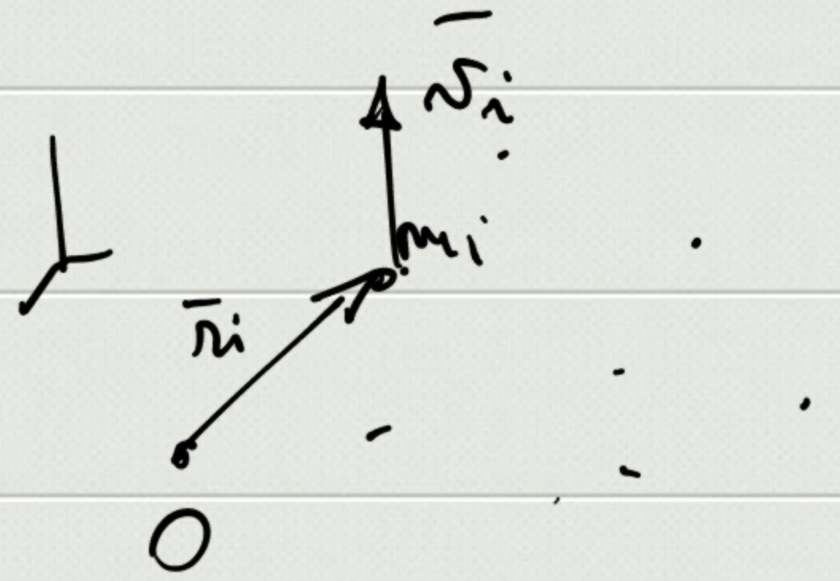
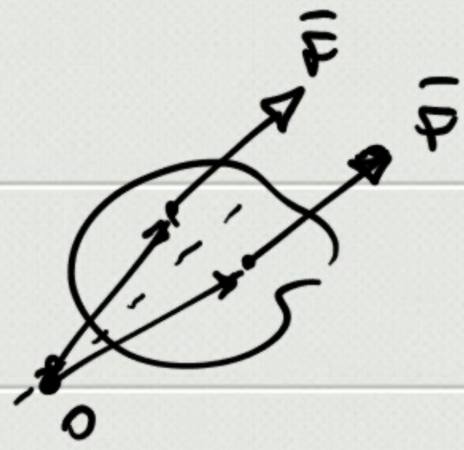
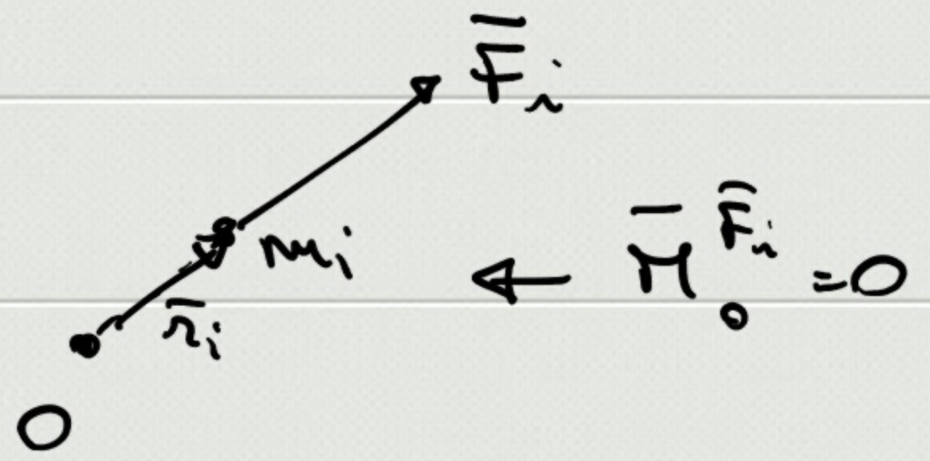
$$\frac{d\bar{L}_O}{dt} = -\bar{v}_O \times m\bar{v}_{CM} + \bar{M}_O^E$$



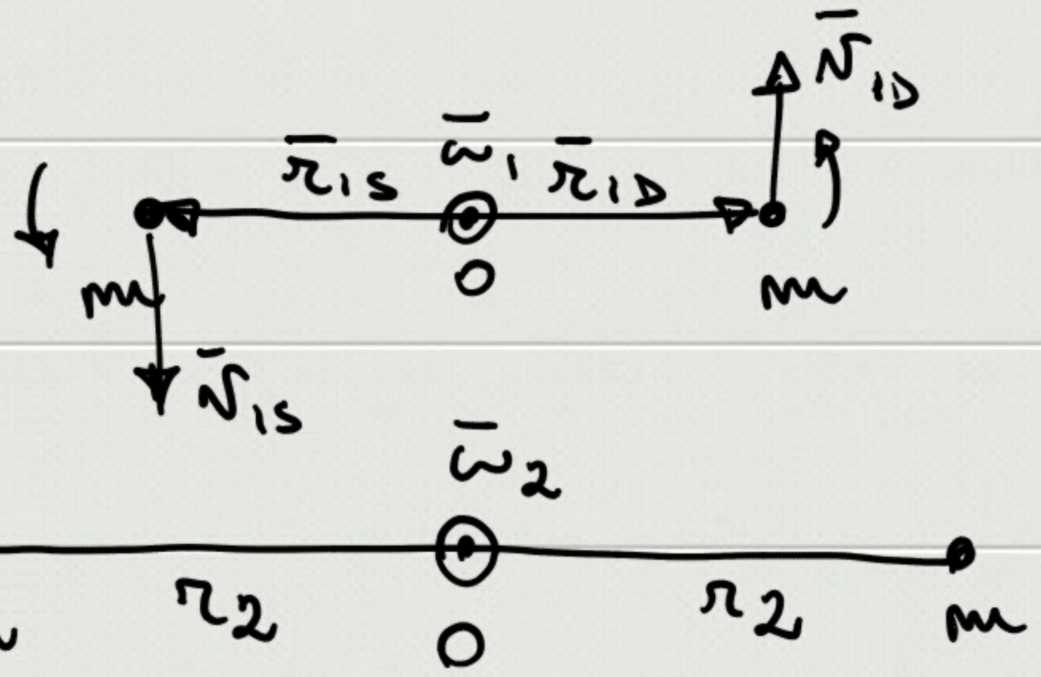
$\bar{M}_O^E = 0$ $\quad R_i = 0$ $\Rightarrow$ sistema isolato

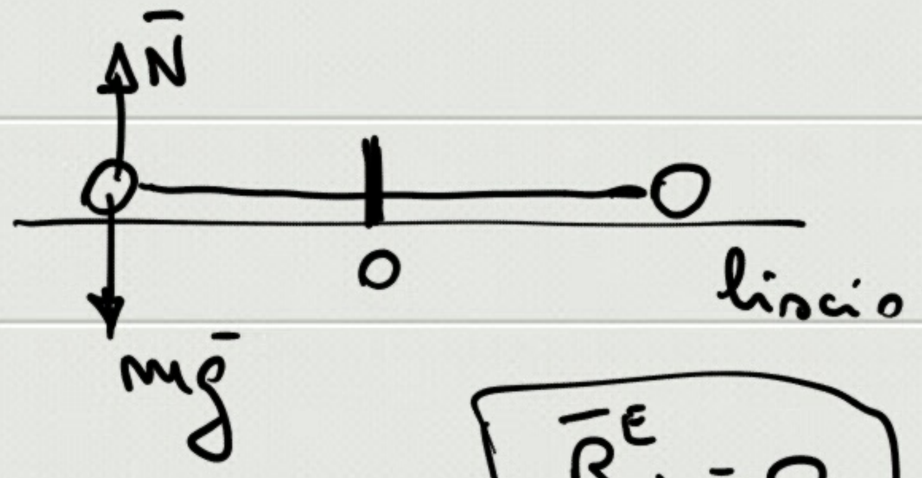




$$\Rightarrow \quad \frac{d\bar{L}_O}{dt} = \bar{M}_O^E = 0 \quad \Rightarrow \quad \boxed{\bar{L}_O = \text{cost}}$$

$$\frac{dL_{O,\alpha}}{dt} = M_{P,\alpha}^E = 0 \quad \Rightarrow \quad \boxed{L_{O,\alpha} = \text{cost}}$$





$$\bar{R}^E_i = 0$$

Polo: O $\qquad \bar{L}_{O,1} = \bar{r}_{1D} \times m\bar{v}_{1D} + \bar{r}_{1S} \times m\bar{v}_{1S} =$

$$= 2\,\bar{r}_1 \times m\bar{v}_1 \qquad \odot \bar{L}$$

Sist. isolato $\Rightarrow$ $\boxed{\bar{L}_O = \text{cost}}$ $\Rightarrow$ $\bar{L}_{O,1} = \bar{L}_{O,2}$

$\Rightarrow$ $L_{O,1} = L_{O,2}$

$$|\bar{L}_O| = 2\pi m v = 2 m \omega r^2$$

$$\Rightarrow \quad \cancel{2m}\,\omega_1 r_1^2 = \cancel{2m}\,\omega_2 r_2^2$$

$$\Rightarrow \quad \omega_2 = \omega_1 \left(\frac{r_1}{r_2}\right)^2 < \omega_1$$