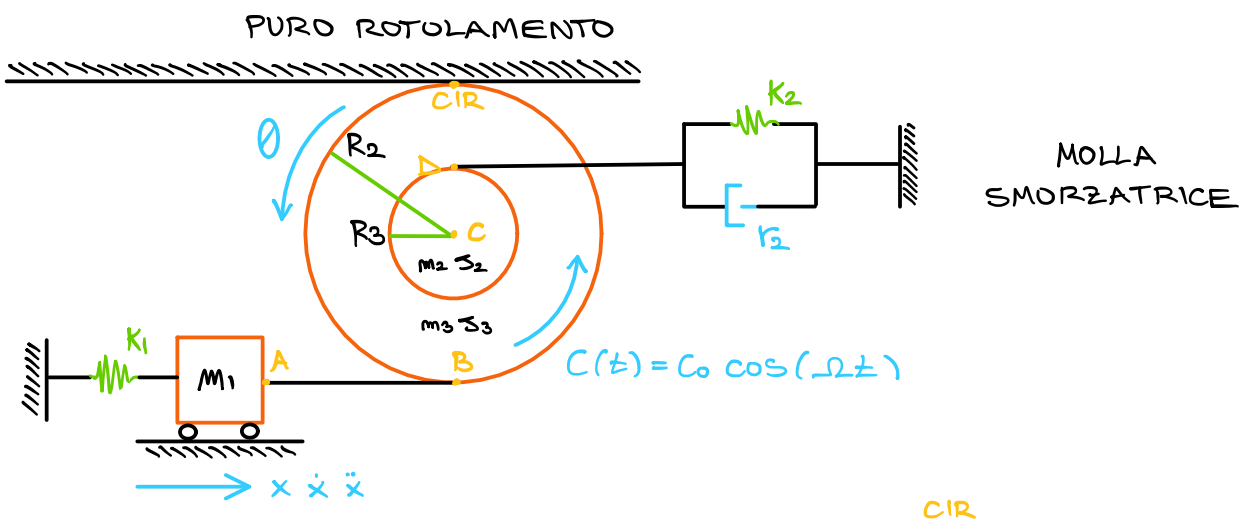
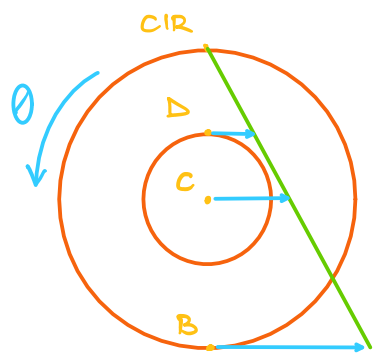
Es10

Monday, 3 January 2022 20:51





LEGAMI CINEMATICI

FUNE INESTENSIBILE $V_A = V_B = \dot{x}$

$x_A = x_B = x = 2R_2\theta$

$\theta = \frac{x}{2R_2} \rightarrow \omega = \frac{\dot{x}}{2R_2}$

$\Delta l_2 = -(R_2 - R_3)\theta = -(R_2 - R_3)\frac{x}{2R_2}$ COMPRESSIONE

$\dot{\Delta} l_2 = -(R_2 - R_3)\omega = -(R_2 - R_3)\frac{\dot{x}}{2R_2}$ COMPRESSIONE

$V_C = V_A/2 = \frac{\dot{x}}{2} = R_2\omega$

ENERGIA CINETICA

$$E_C = \frac{1}{2}m_1 V_1^2 + \frac{1}{2}(m_2 + m_3)V_C^2 + \frac{1}{2}(J_2 + J_3)\omega^2$$

$$= \frac{m_1\dot{x}^2}{2} + \frac{(m_2+m_3)\dot{x}^2}{8} + \frac{(J_2+J_3)\dot{x}^2}{8R_2^2}$$

$$= \frac{1}{2}\underbrace{\left[m_1 + \frac{(m_2+m_3)}{4} + \frac{(J_2+J_3)}{4R_2^2} \right]}_{m^*}\dot{x}^2 = \frac{1}{2}m^*\dot{x}^2$$

$\frac{\partial E_C}{\partial x} = 0$ $\qquad \frac{d}{dt}\left(\frac{\partial E_C}{\partial \dot{x}}\right) = \frac{d}{dt}(m^*\dot{x}) = m^*\ddot{x}$

FUNZIONE DISSIPATIVA

$$\Delta = \frac{1}{2}r\,\dot{\Delta} l_2^2 = \frac{1}{2}\underbrace{r\left(\frac{R_2 - R_3}{2R_2}\right)^2}_{r^*}\dot{x}^2 = \frac{1}{2}r^*\dot{x}^2$$

$\frac{\partial \Delta}{\partial \dot{x}} = r^*\dot{x}$

FUNZIONE POTENZIALE

CI SARA' UNE V_{GRAV} ? NO

LE H DEI BARICENTRI NON CAMBIANO

$$V = V_E = \frac{1}{2}K_1\Delta l_1^2 + \frac{1}{2}K_2\Delta l_2^2$$

$$= \frac{1}{2}K_1 x^2 + \frac{1}{2}K_2\left(-\frac{R_2 - R_3}{2R_2}\right)^2 x^2$$

$$= \frac{1}{2}\underbrace{\left[K_1 + K_2\left(\frac{R_2 - R_3}{2R_2}\right)^2\right]}_{K^*}x^2 = \frac{1}{2}K^*x^2$$

$\frac{\partial V}{\partial x} = K^*x$

LAVORO VIRTUALE

$\delta L = C(t)\cdot\delta\theta$

$\omega = \frac{\dot{x}}{2R_2} \rightarrow \delta\theta = \frac{\delta x}{2R_2}$

$\delta L = \frac{C(t)\,\delta x}{2R_2}$ $\qquad \frac{\delta L}{\delta x} = \frac{C(t)}{2R_2} = F_0^*$

EQUAZIONE DI MOTO

$m^*\ddot{x} + r^*\dot{x} + K^*x = F_0^*(t)$