Chariot élevateur à bateau

Pb : J dans C

$$E_c(2/1) = \frac{1}{2} m \vec{v}^2(G \in 2/1) + \frac{1}{2} J \cdot \dot{\alpha}^2$$

$$\vec{v}(G \in 2/1) = -a\dot{\alpha}\vec{y_3} + c\dot{\alpha}\vec{x_3} =$$

$$E_c(2/1) = \frac{1}{2} m (a^2 + c^2)\dot{\alpha}^2 + \frac{1}{2} J \dot{\alpha}^2 = \frac{1}{2} J_{eq} \dot{\alpha}^2$$

$$E_c(2/1) = \frac{1}{2}\left[m(a^2 + c^2) + J \right]\dot{\alpha}^2 = \frac{1}{2} J_{eq} \dot{\alpha}^2$$

Autre solution : Huygens

$$J_{eq} = J + m(a^2 + c^2). \qquad E_c(2/1) = \frac{1}{2} J_{eq} \dot{\alpha}^2$$

$$P_{frott} = -\mu \cdot \dot{\alpha}^2$$

$$P_{vent} = \vec{F}_{vent} \cdot \vec{v}(B_1 \in 2/1) = p S \vec{y_2} \cdot \vec{v}(B_1 \in 2/1)$$

$$\vec{v}(B_1 \in 2/1) = (b + \lambda)\dot{\alpha}\vec{x_2} + \dot{\lambda}\vec{y_2}$$

$$P_{vent} = p S \dot{\lambda} = p S \frac{\dot{\alpha}}{k}.$$

$$P_{pes} = (-mg\vec{y_1}) \cdot (-a\dot{\alpha}\vec{y_3} + c\dot{\alpha}\vec{x_3})$$

$$P_{pes} = mg\dot{\alpha}(a\cos\alpha + c\sin\alpha) \simeq mga\dot{\alpha}$$

$$TEC \Rightarrow J_{eq}\ddot{\alpha}\dot{\alpha} = -\mu\dot{\alpha}^2 + \frac{pS\dot{\alpha}}{k} + mga\dot{\alpha}$$

$$\Rightarrow J_{eq}\ddot{\alpha} + \mu\dot{\alpha} = \frac{pS}{k} + mga.$$