Hubler

(Q1) On isole (S'), TMD en O_1

$\vec{\delta}(G_{S'}, S'/R_0) = \vec{0}$

$\vec{\delta}(O_1, S'/R_0) = \vec{O G_{S'}} \wedge m_{S'} \dot{V} \vec{y_0}$

$= z_{GS'} . \vec{z_S} \wedge m_{S'} \dot{V} . \vec{y_0}$

$= - z_{GS'} . m_{S'} \dot{V} . \cos\beta . \vec{x_0}$

Rem : En fait

$TMD \Rightarrow - z_{GS'} m_{S'} \dot{V} \cos\beta = - \frac{2 C_m}{R} + m_{S'} g z_{GS'} \sin\beta$

$\Rightarrow C_m = + \frac{R}{2} . z_{GS'} . m_{S'} . (\dot{V} \cos\beta + g \sin\beta)$

(Q2) $P_{pes} = 0$

$P_{moteur} = 2 \frac{C_m}{R} \omega_{R1}$

$P_{frott} = - 2 C_f . \omega_{R1}$

$P = 2 \left(\frac{C_m}{R} - C_f\right) \omega_{R1}$

$\dot{V} = R . \omega_{R1}$

(Q3) $E_c(S/R_0) = \frac{2}{2} J_R . \omega_{R1}^2 + \frac{1}{2} m_S \dot{V}^2$

$E_c(S/R_0) = \frac{1}{2} . (2 J_R + m_S R^2) . \omega_{R1}^2$

(Q4) **TEC** $\Rightarrow (2 J_R + m_S R^2) \dot{\omega}_{R1} \cancel{\omega_{R1}} = 2 \left(\frac{C_m}{R} - C_f\right) \cancel{\omega_{R1}}$

$\frac{2 C_m}{R} = (2 J_R + m_S R^2) \dot{\omega}_{R1} + 2 C_f .$

$C_m = R \left(J_R + \frac{m_S R^2}{2}\right) . \dot{\omega}_{R1} + R C_f$

(Q5) $C_f = 0 \Rightarrow C_m = R \left(J_R + \frac{m_S R^2}{2}\right)$

Rappel : $C_m = R z_{GS'} m_{S'} (\dot{V} \cos\beta + g \sin\beta)$

$\Rightarrow \dot{V} = \dots$