② METODA PĘDU I KRĘTU

$$\vec{p} = 2m\vec{v}_c = [-2mv_c, 0, 0] \qquad \vec{\Omega}_p = [0, 0, v_c/R]$$

$$(\mathring{\vec{p}})_{lok} \equiv \vec{0}$$

$$(\mathring{\vec{p}})_{lok} + \vec{\Omega} \times \vec{p} = 2m\vec{g} + \vec{N}_1 + \vec{N}_2 + \vec{T}$$

$$\vec{\Omega} \times \vec{p} = \begin{vmatrix} \vec{e}_\xi & \vec{e}_\eta & \vec{e}_\zeta \\ 0 & 0 & v_c/R \\ -2mv_c & 0 & 0 \end{vmatrix} = [0, -2mv_c^2/R, 0]$$

$$\begin{cases} 0 = 0 \; (R_1 + R_2) \\ -2mv_c^2/R = -T \longrightarrow T = 2mv_c^2/R \\ 0 = N_1 + N_2 - 2mg \longrightarrow N_2 = 2mg - N_1 \end{cases}$$

$$\vec{K}_0 = \mathbb{I}_0 \vec{\omega} \qquad \vec{\omega} = \vec{\Omega}_p + \vec{\omega}_W \qquad \vec{\omega}_W = [0, -v_c/r, 0]$$

$$\vec{\omega} = [0, -v_c/r, v_c/R]$$

$$\mathbb{I}_0 = \begin{bmatrix} \frac{1}{4}mr^2 + m(R-h)^2 + \frac{1}{4}mr^2 + m(R+h)^2 & 0 & 0 \\ 0 & 2 \cdot \frac{1}{2}mr^2 & 0 \\ 0 & 0 & I_\zeta = I_\zeta \end{bmatrix}$$

$$\vec{K}_0 = \mathbb{I}_0 \vec{\omega} = \left[0, mr^2\left(\frac{-v_c}{r}\right), I_\zeta v_c/R\right]$$

$$(\mathring{\vec{K}}_0)_{lok} \equiv \vec{0}$$

$$(\mathring{\vec{K}}_0)_{lok} + \vec{\Omega} \times \vec{K}_0 = \vec{M}_0(2m\vec{g}) + \vec{M}_0(\vec{N}_1) + \vec{M}_0(\vec{N}_2) + \vec{M}_0(\vec{T})$$

$$\vec{\Omega} \times \vec{K}_0 = \begin{vmatrix} \vec{e}_\xi & \vec{e}_\eta & \vec{e}_\zeta \\ 0 & 0 & v_c/R \\ 0 & -mrv_c & I_\zeta \frac{v_c}{R} \end{vmatrix} = [mrv_c^2/R, 0, 0]$$

$$\begin{cases} mv_c^2 \frac{r}{R} = N_1(R-h) + N_2(R+h) - 2mgR - Tr \\ 0 = 0 \; (-R_1 r - R_2 r) \\ 0 = 0 \; -R_1(R-r) - R_2(R+r) \end{cases} \qquad N_1 = mg - \frac{3}{2}mv_c^2\frac{r}{Rh}$$

Verte

$$N_2 = mg + \frac{3}{2}mv_c^2\frac{r}{Rh}$$