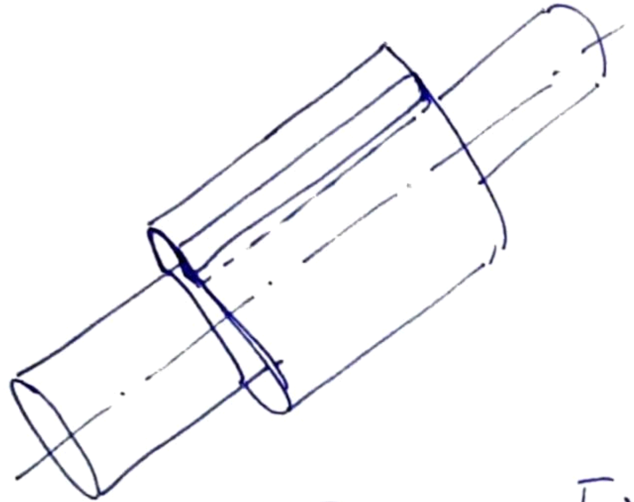
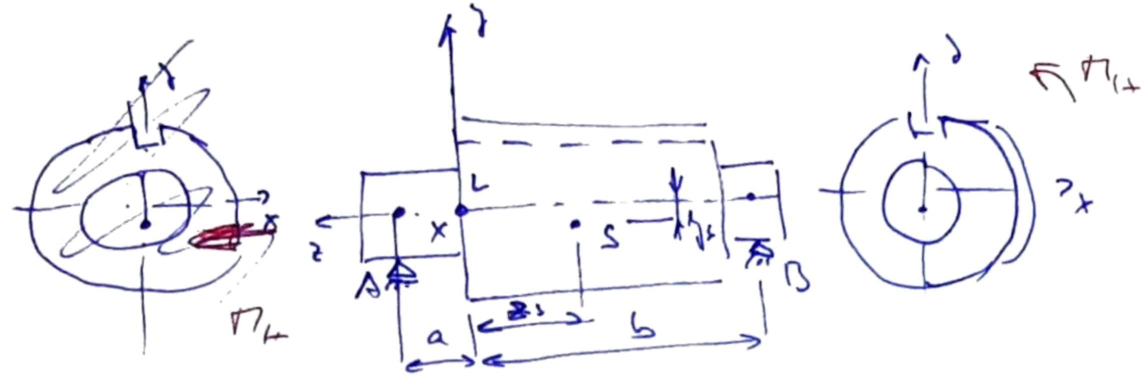
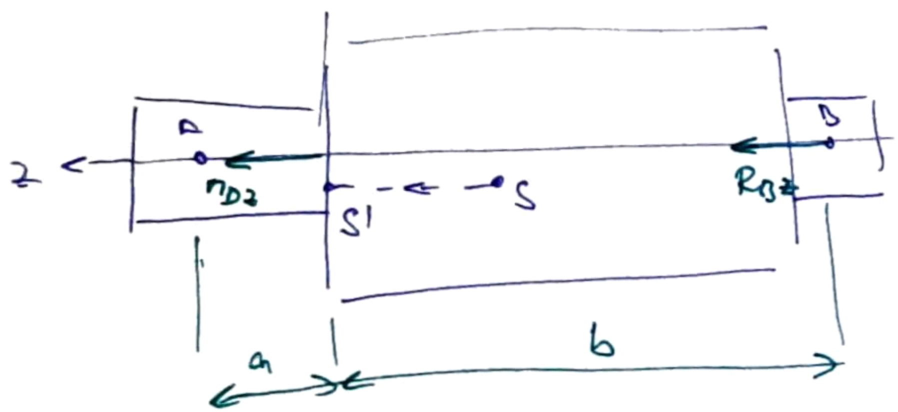
CHOBNÍ HŘÍDELE

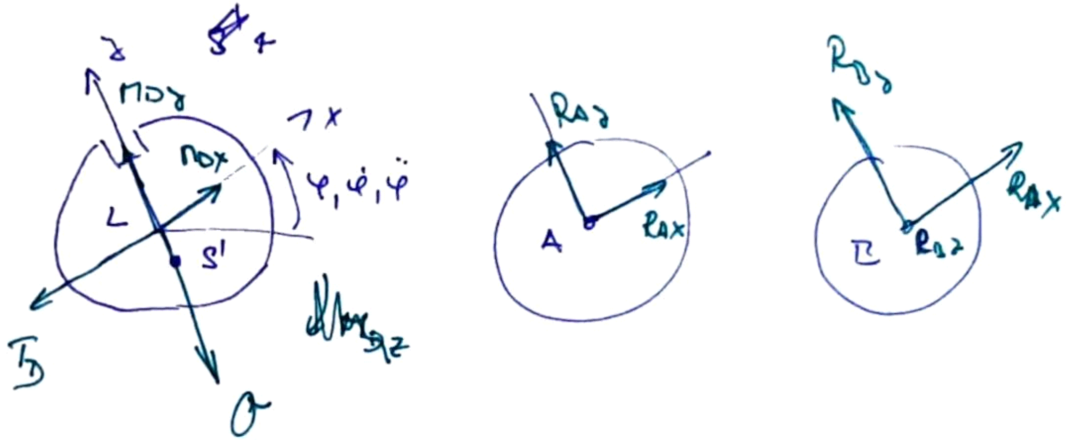




D: $\vec{r}_S = \begin{bmatrix} 0 \\ y_S \\ z_S \end{bmatrix}$, $\underline{I} = \begin{bmatrix} J_x & 0 & 0 \\ 0 & J_y & -D_{yz} \\ 0 & -D_{yz} & J_z \end{bmatrix}$, $m, a, b, M_k = konst.$

C: Reakce v A, B





$\vec{x}: \cancel{-R_{Bz} = 0}\ R_{Ax} + R_{Bx} - T_D = 0$

$y\uparrow: R_{Ay} + R_{By} - G = 0$

$\leftarrow z: R_{Bz} = 0$

$\overset{\curvearrowleft}{x}: M_{Dx} - R_{Ay} \cdot a + R_{By} \cdot b = 0$

$\overset{\curvearrowleft}{y}: M_{Dy} + R_{Ax} \cdot a - R_{Bx} \cdot b = 0$

$\overset{\curvearrowleft}{z}: M_k + M_{Dz} = 0$

$\cancel{e = \sqrt{\ }}$ $e = y_S$

$T_D = m \cdot y_S \cdot \alpha$

$O = m \cdot y_S \cdot \omega^2$

$\vec{M}_D = \cancel{I \cdot \vec{\alpha} + \vec{\omega} \times (I \cdot \vec{\omega})}$

$-I \cdot \vec{\alpha} + (I \cdot \vec{\omega}) \times \vec{\omega}$

$$\vec{M}_D = -\begin{bmatrix} J_x & 0 & 0 \\ 0 & J_y & -D_{yz} \\ 0 & -D_{yz} & J_z \end{bmatrix} \cdot \begin{bmatrix} 0 \\ 0 \\ \alpha \end{bmatrix} + \begin{bmatrix} J_x & 0 & 0 \\ 0 & J_y & -D_{yz} \\ 0 & -D_{yz} & J_z \end{bmatrix} \begin{bmatrix} 0 \\ 0 \\ \omega \end{bmatrix} \times \begin{bmatrix} 0 \\ 0 \\ \omega \end{bmatrix} =$$

$$= -\begin{bmatrix} 0 \\ -D_{yz}\,\alpha \\ J_z \cdot \alpha \end{bmatrix} + \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 0 & -D_{yz}\,\omega & J_z \cdot \omega \\ 0 & 0 & \omega \end{vmatrix} =$$

$$= \begin{bmatrix} 0 \\ D_{yz}\,\alpha \\ -J_z \cdot \alpha \end{bmatrix} + \begin{bmatrix} -D_{yz}\,\omega^2 \\ 0 \\ 0 \end{bmatrix} = \begin{bmatrix} -D_{yz}\,\omega^2 \\ D_{yz}\,\alpha \\ -J_z \cdot \alpha \end{bmatrix}$$

$M_H + (-J_z \cdot \alpha) = 0 \Rightarrow \alpha = \dfrac{M_H}{J_z}$, $\omega = \alpha \cdot t$

$R_{Ax} + R_{Bx} - m \cdot y_s \cdot \alpha = 0$ (1)

$R_{Ay} + R_{By} - m \cdot y \cdot \cancel{\alpha^2 t^2}\,\omega^2 = 0$ (2)

$-R_{Ay} \cdot a + R_{By} \cdot b - D_{yz}\,\omega^2 = 0$ (3) $\Rightarrow R_{Ax}, R_{Ay}, R_{Bx}, R_{By}$

$R_{Ax}\,a - R_{Bx}\,b + D_{yz}\,\alpha = 0$ (4)

Pozn. V tomto případě závisí Reakce ve směru x na zrychlení „α" a ve směru „y" na okamžité rychlosti „ω"