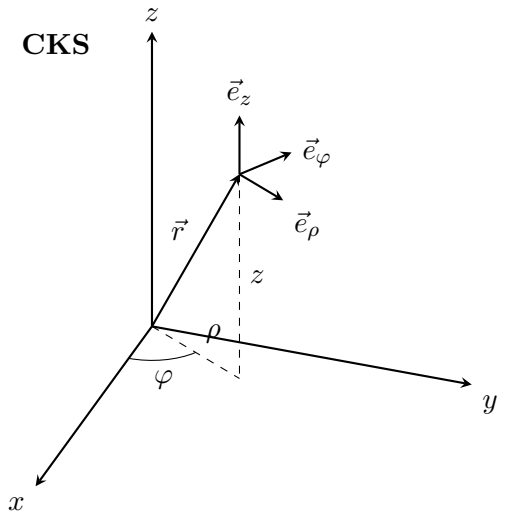
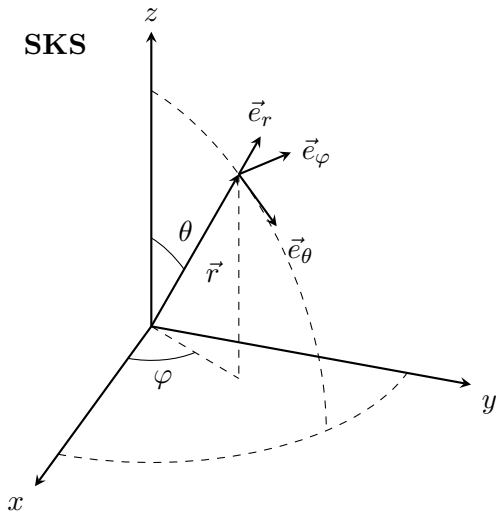
1 Koordinatni sistemi

KKK	$\vec{e}_x = \vec{i}$	$\vec{e}_y = \vec{j}$	$\vec{e}_z = \vec{k}$
$\vec{r}$	x	y	z
$\vec{v}$	$\dot{x}$	$\dot{y}$	$\dot{z}$
$\vec{a}$	$\ddot{x}$	$\ddot{y}$	$\ddot{z}$
CKS/PKS	$\vec{e}_\rho$	$\vec{e}_\varphi$	$\vec{e}_z$
$\vec{r}$	ρ	0	z
$\vec{v}$	$\dot{\rho}$	$\rho\dot{\varphi}$	$\dot{z}$
$\vec{a}$	$\ddot{\rho} - \rho\dot{\varphi}^2$	$\rho\ddot{\varphi} + 2\dot{\rho}\dot{\varphi}$	$\ddot{z}$
SKS	$\vec{e}_r$	$\vec{e}_\theta$	$\vec{e}_\varphi$
$\vec{r}$	r	0	0
$\vec{v}$	$\dot{r}$	$r\dot{\theta}$	$r\dot{\varphi}\sin\theta$
$\vec{a}$	$\ddot{r} - r\dot{\theta}^2 - r\dot{\varphi}^2\sin^2\theta$	$r\ddot{\theta} + 2\dot{r}\dot{\theta} - r\dot{\varphi}^2\sin\theta\cos\theta$	$r\ddot{\varphi}\sin\theta + 2\dot{r}\dot{\varphi}\sin\theta + 2r\dot{\theta}\dot{\varphi}\cos\theta$
NKS	$\vec{e}_t$	$\vec{e}_n$	$\vec{e}_b$
$\vec{r}$	–	–	–
$\vec{v}$	$\dot{s}$	0	0
$\vec{a}$	$\ddot{s}$	$\kappa\dot{s}^2$	0





$$\begin{pmatrix} \vec{e}\,'_t \\ \vec{e}\,'_n \\ \vec{e}\,'_b \end{pmatrix} = \begin{pmatrix} 0 & \kappa & 0 \\ -\kappa & 0 & \tau \\ 0 & -\tau & 0 \end{pmatrix} \begin{pmatrix} \vec{e}_t \\ \vec{e}_n \\ \vec{e}_b \end{pmatrix}$$

$$\vec{S} = \tfrac{1}{2}\,\vec{r}\times\vec{v}$$
$$S = \tfrac{1}{2}\,\rho^2\,\dot{\varphi}\ \text{(PKS)}$$

$$\mathrm{d}s = \sqrt{\mathrm{d}x^2 + \mathrm{d}y^2 + \mathrm{d}z^2}$$
$$\vec{e}_t = \vec{r}\,';\ R_{\mathrm{pr}} = \frac{1}{\kappa}$$

2 Kinematika togega telesa

$$\vec{v} = \vec{\omega} \times \vec{r}$$

$$\begin{aligned}\vec{v}_2 &= \vec{v}_1 + \vec{\omega} \times \vec{\rho}_{12} \\ \vec{a}_2 &= \vec{a}_1 + \vec{\alpha} \times \vec{\rho}_{12} - \omega^2 \vec{\rho}_{12}\end{aligned}$$

$$\begin{aligned}\lambda = \frac{\pi}{2},\ \rho = \frac{v}{\omega}\ &\text{(pol hitrosti)} \\ \sin\lambda = \frac{\alpha\rho}{a},\ \cos\lambda = -\frac{\omega^2\rho}{a}\ &\text{(pol pospeška)} \\ \tan\lambda = -\frac{\alpha}{\omega^2},\ \rho = \frac{a}{\sqrt{\alpha^2+\omega^4}}&\end{aligned}$$

3 Dinamika togega telesa

$$I_{ij} = \sum_k m_k \left(r_k^2\,\delta_{ij} - r_{ik}\,r_{jk}\right)$$

$$\vec{L} = \vec{\vec{I}}\,\vec{\omega},\ E_{\text{kin}} = \tfrac{1}{2}\,\vec{\omega}\cdot\vec{L}$$

$$\begin{aligned}\vec{M} = \frac{\mathrm{d}\vec{L}}{\mathrm{d}t} &= \left(\frac{\mathrm{d}\vec{L}}{\mathrm{d}t}\right)_{\text{tel}} + \vec{\omega}\times\vec{L} \\ I_1\,\dot{\omega}_1 + (I_3 - I_2)\,\omega_2\,\omega_3 &= M_1 \\ I_2\,\dot{\omega}_2 + (I_1 - I_3)\,\omega_3\,\omega_1 &= M_2 \\ I_3\,\dot{\omega}_2 + (I_2 - I_1)\,\omega_1\,\omega_2 &= M_3\end{aligned}$$

4 Langrangeova enačba

$$\begin{aligned}L &= T - V \\ \frac{\mathrm{d}}{\mathrm{d}t}\left(\frac{\partial L}{\partial \dot{q}_i}\right) - \frac{\partial L}{\partial q_i} &= 0\end{aligned}$$

$$\begin{aligned}L &= T - V \\ \frac{\mathrm{d}}{\mathrm{d}t}\left(\frac{\partial L}{\partial \dot{q}_i}\right) - \frac{\partial L}{\partial q_i} &= \sum_j a_{ji}\lambda_j\ (i\text{-ta koordinata}) \\ \sum_i a_{ji}\dot{q}_i &= 0\ (j\text{-ti pogoj})\end{aligned}$$

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