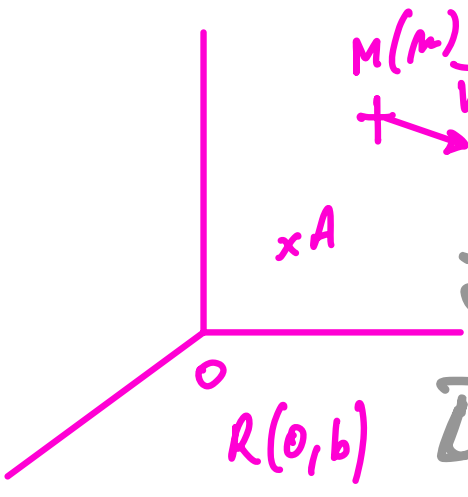
TORSEUR CINETIQUE

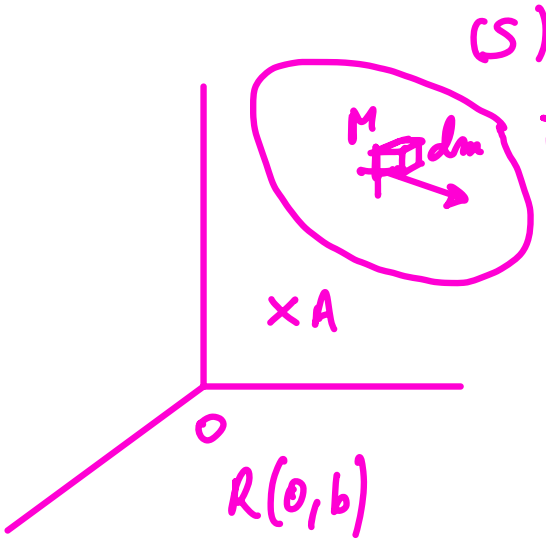


quantité de mvt : $\vec{p} = \vec{Q_v}$

$\vec{Q_v}(M/R) = m\,\vec{V}(M/R)$

$\vec{\sigma}(A,\vec{Q_v}) = \overrightarrow{m}(A,\vec{Q_v}) = \overrightarrow{AM} \wedge \vec{Q_v}(M/R)$

$\vec{L}(A,\vec{p})$ Moment Cinetique



$$\vec{Q_v}(S/R) = \iiint_{M\in S} \vec{V}(M,S/R)\,dm$$

Moment des $\vec{Q_v}$ → Moment Cinétique

$$\vec{L}(A,S/R) = \vec{\sigma}(A,S/R) = \iiint_{M\in S} \overrightarrow{AM} \wedge \vec{V}(M,S/R)\,dm$$

$$\vec{\sigma}(A,S/R) = \iiint_{M\in S} \overrightarrow{AB} \wedge \vec{V}(M,S/R)\,dm + \underbrace{\iiint_{M\in S} \overrightarrow{BM} \wedge \vec{V}(M,S/R)\,dm}_{\vec{\sigma}(B,S/R)}$$

$$\vec{\sigma}(A,S/R) = \vec{\sigma}(B,S/R) + \overrightarrow{AB} \wedge \underbrace{\iiint \vec{V}(M,S/R)\,dm}_{\vec{Q_v}}$$

Torseur Cinétique

$$\mathcal{C}(S/R) = \left\{ \vec{Q}_v \;,\; \vec{M}(A, \vec{Q}_v) \right\}_A$$

Résultante Cinétique : $\vec{R}_c(S/R) = \vec{Q}_v = \iiint \vec{v}(M,S/R)\, dm$

Moment Cinétique : $\vec{\sigma}(A,S/R) = \iiint \vec{AM} \wedge \vec{v}(M,S/R)\, dm$.

$$\vec{R}_c(S/R) = \iiint \vec{v}(M,S/R)\, dm = m\, \vec{v}(G,S/R)$$

$$\iiint \left[\vec{v}(G,S/R) + \vec{MG} \wedge \vec{\Omega}(S/R) \right] dm$$

$$\iiint_{M \in S} \vec{v}(G,S/R)\, dm + \iiint \vec{MG} \wedge \vec{\Omega}(S/R)\, dm$$

$$\left(\iiint dm \right) \vec{v}(G,S/R) + \left(\iiint_{M \in S} \vec{MG}\, dm \right) \wedge \vec{\Omega}(S/R)$$

$$m\, \vec{v}(G,S/R) \qquad \vec{0} \qquad \vec{0}$$

Formule du Moment Cinétique

$$\vec{\sigma}(A,S/R) = \iiint \vec{AM} \wedge \vec{v}(M,S/R)\, dm$$

$$\vec{\tau}(A,S/R) = \iiint \vec{AM} \wedge (\vec{v}(A,S/R) + \vec{MA} \wedge \vec{\Omega}(S/R))\,dm$$

$$= \iiint_{M \in S} \vec{AM} \wedge \vec{v}(A,S/R)\,dm + \iiint \vec{AM} \wedge (\vec{MA} \wedge \vec{\Omega}(S/R))\,dm.$$

$$= -\iiint \vec{AM} \wedge (\vec{AM} \wedge \vec{\Omega}(S/R))\,dm + \left(\iiint \vec{AM}\,dm\right) \wedge \vec{v}(A,S/R)$$

$$\boxed{\vec{\tau}(A,S/R) = J(A,S)\,\vec{\Omega}(S/R) + m\,\vec{AG} \wedge \vec{v}(A,S/R)}$$

(at)

$$\mathcal{C}(S/R) = \left\{ m\,\vec{v}(G,S/R)\ ,\ \vec{\tau}(A,S/R) \right\}_A$$

$$\vec{\tau}(B,S/R) = \vec{\tau}(A,S/R) + \vec{BA} \wedge m\,\vec{v}(G,S/R)$$

1| $A \equiv G$ $\quad \vec{\tau}(G,S/R) = J(G,S)\,\vec{\Omega}(S/R)$

$$\left[\vec{\tau}(A,S/R) = \vec{\tau}(G,S/R) + \vec{AG} \wedge m\vec{v}(G,S/R)\right]$$

2| $A \in S \rightarrow$ pt de Vitesse Nulle $\rightarrow \vec{v}(A,S/R) = \vec{0}$

$$\vec{\tau}(A,S/R) = J(A,S)\,\vec{\Omega}(S/R)$$

Ensemble de Solide : $S = (S_1 \cup S_2)$

$$\mathcal{C}(S/R) = \mathcal{C}(S_1/R) + \mathcal{C}(S_2/R)$$

CHASLES $\quad e(2|0) = e(2|1) + e(1|0)$

$e(2+1|0) = e(2|0) + e(1|0)$