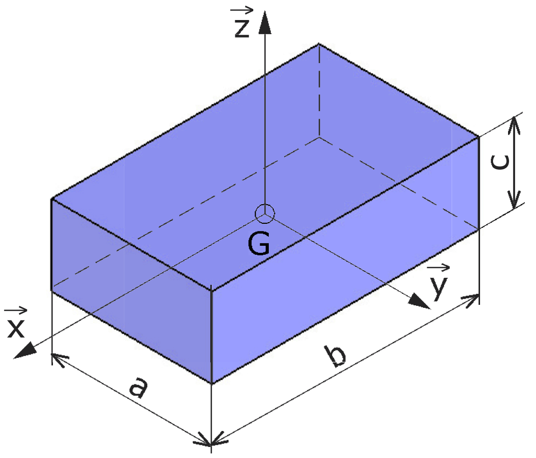
Matrices d'inertie de solides usuels

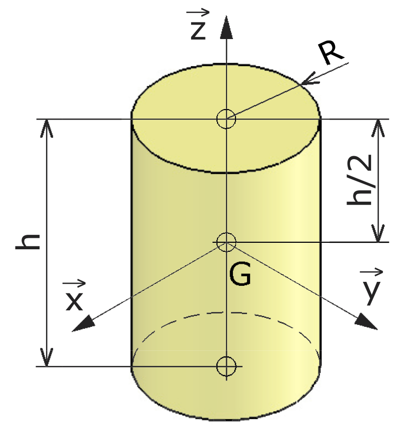
m est la masse du solide

Parallélépipède



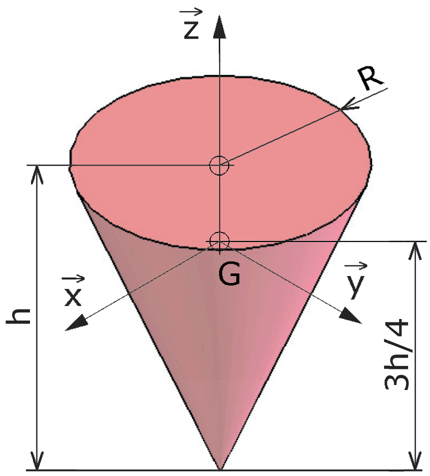
$$\mathscr{I}(G,S)=\begin{bmatrix}\frac{m}{12}\left(b^2+c^2\right) & 0 & 0\\ 0 & \frac{m}{12}\left(a^2+c^2\right) & 0\\ 0 & 0 & \frac{m}{12}\left(a^2+b^2\right)\end{bmatrix}_B$$

Cylindre de révolution



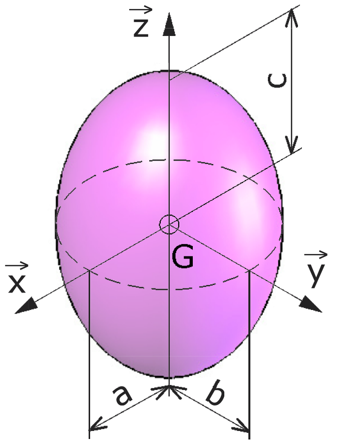
$$\mathscr{I}(G,S)=\begin{bmatrix}m\left(\frac{R^2}{4}+\frac{h^2}{12}\right) & 0 & 0\\ 0 & m\left(\frac{R^2}{4}+\frac{h^2}{12}\right) & 0\\ 0 & 0 & m\frac{R^2}{2}\end{bmatrix}_B$$

Cône de révolution



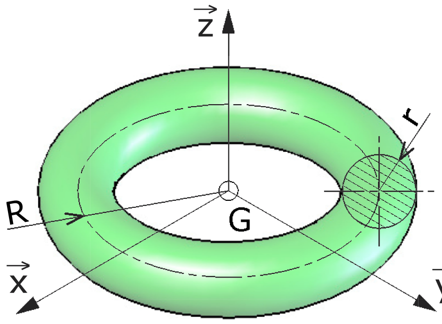
$$\mathscr{I}(G,S)=\begin{bmatrix}\frac{3}{20}m\left(R^2+\frac{h^2}{4}\right) & 0 & 0\\ 0 & \frac{3}{20}m\left(R^2+\frac{h^2}{4}\right) & 0\\ 0 & 0 & \frac{3}{10}mR^2\end{bmatrix}_B$$

Ellipsoïde



$$\mathcal{J}(G,S)=\begin{bmatrix} \frac{m}{5}\left(b^2+c^2\right) & 0 & 0 \\ 0 & \frac{m}{5}\left(a^2+c^2\right) & 0 \\ 0 & 0 & \frac{m}{5}\left(a^2+b^2\right) \end{bmatrix}_B$$

Tore



$$\mathcal{J}(G,S)=\begin{bmatrix} m\left(\frac{R^2}{2}+\frac{5r^2}{8}\right) & 0 & 0 \\ 0 & m\left(\frac{R^2}{2}+\frac{5r^2}{8}\right) & 0 \\ 0 & 0 & m\left(R^2+\frac{3r^2}{4}\right) \end{bmatrix}_B$$