SITE PÉDAGOGIQUE M. MULLER

Installation des logiciels pédagogiques

Licence Microsoft Office gratuite pour les étudiants

Procedure pour installer SolidWorks version etudiant :
Procédure d'installation SW SDK

Telechargement de RDM LeMans V7.04

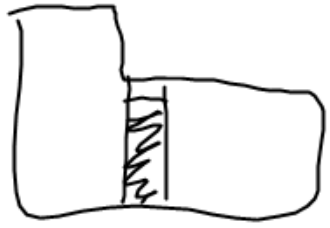
Scilab V5.5.2 + XCOS/SIMM : lire les instructions dans les dossiers et suivre l'ordre (attention zip de 780 Mo)

Cura 3.4 pour imprimante 3D Volumic

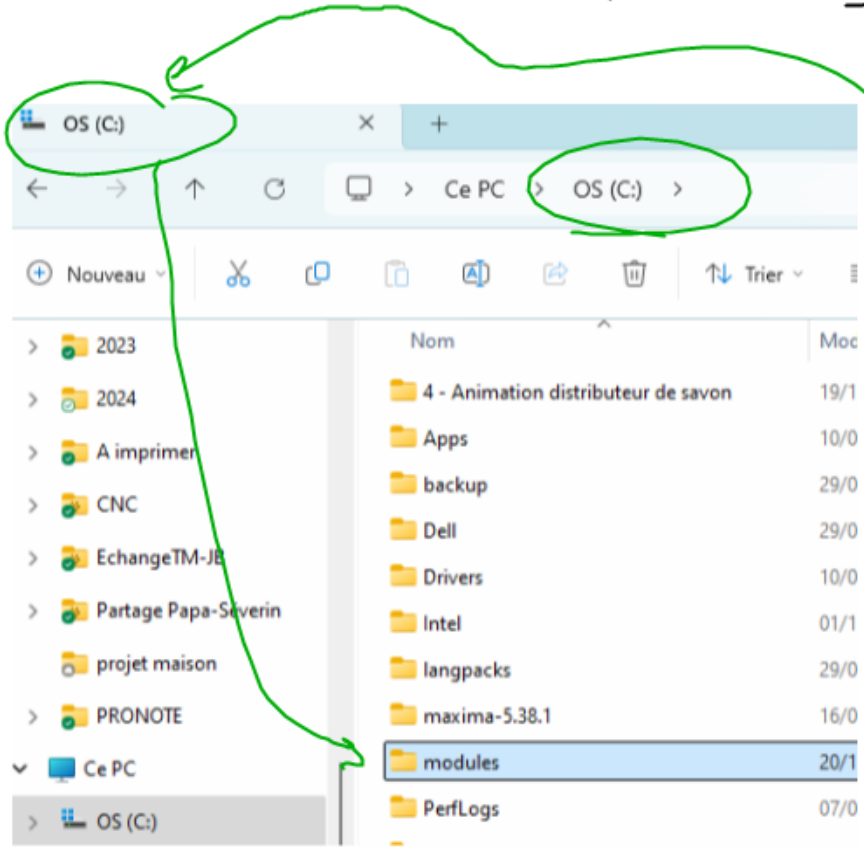
Fritzing pour réaliser des PCB

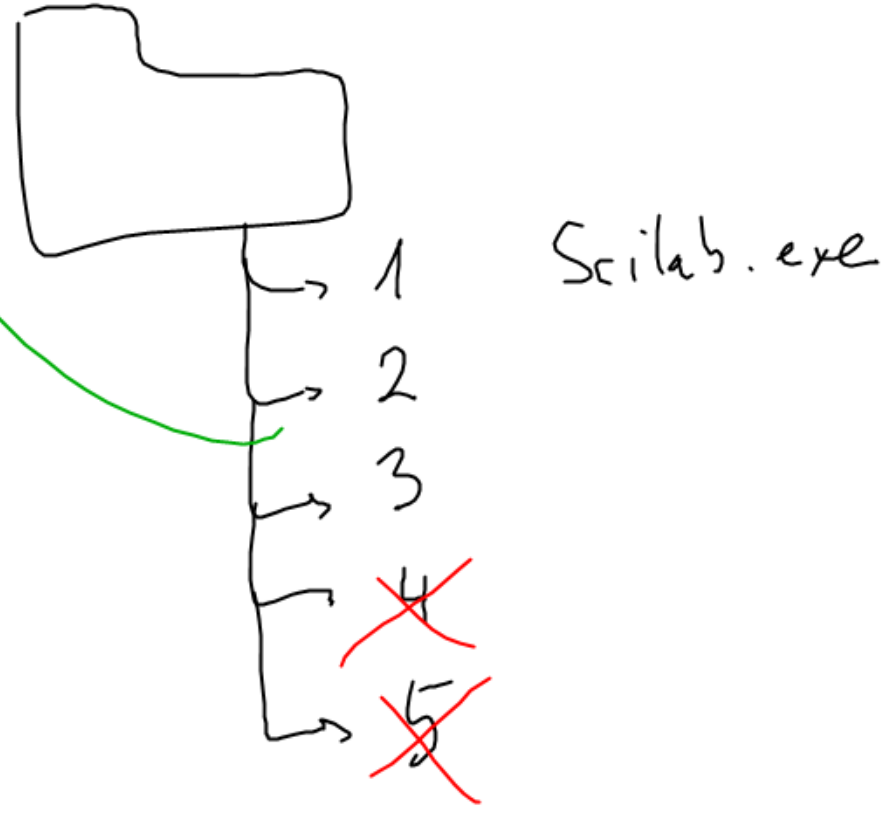
FlatCAM pour programmer la fraiseuse numérique

télécharger le ZIP

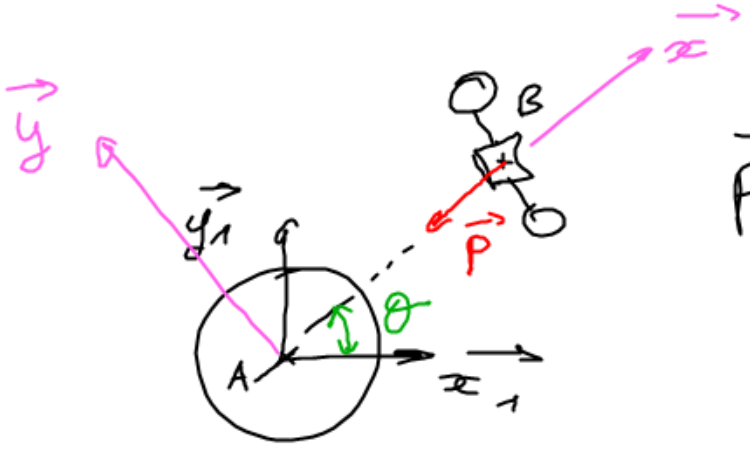


puis l'extraire



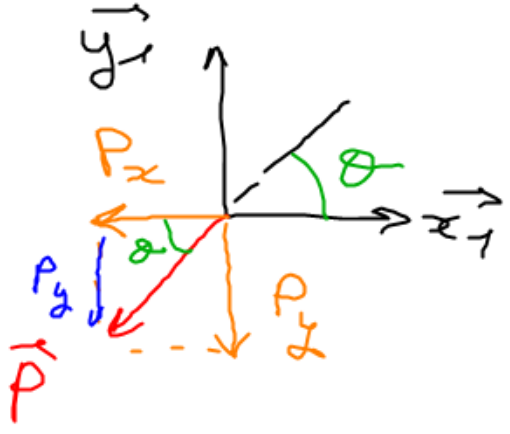


Scilab.exe



$$\vec{P} = \begin{pmatrix} -P \\ 0 \\ 0 \end{pmatrix}_R = \begin{pmatrix} -P\cos\theta \\ -P\sin\theta \\ 0 \end{pmatrix}_{R_1}$$

$$\|\vec{P}\| = \sqrt{x^2+y^2+z^2}$$



$$\vec{P_x} = \begin{pmatrix} -P\cos\theta \\ 0 \\ 0 \end{pmatrix}$$

$\|\vec{P_x}\| > 0$

Norme

$$\vec{P_y} = \begin{pmatrix} 0 \\ -P\sin\theta \\ 0 \end{pmatrix}$$

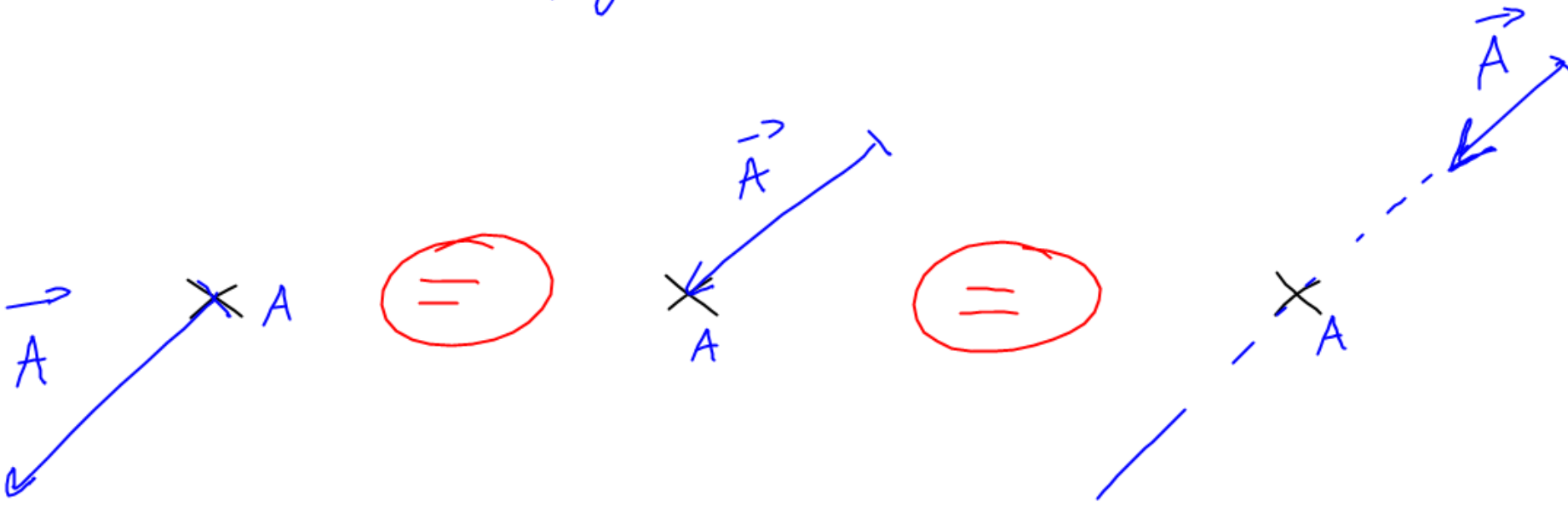
$\neq$

$$\vec{P} = \vec{P_x} + \vec{P_y}$$

Coordonnées

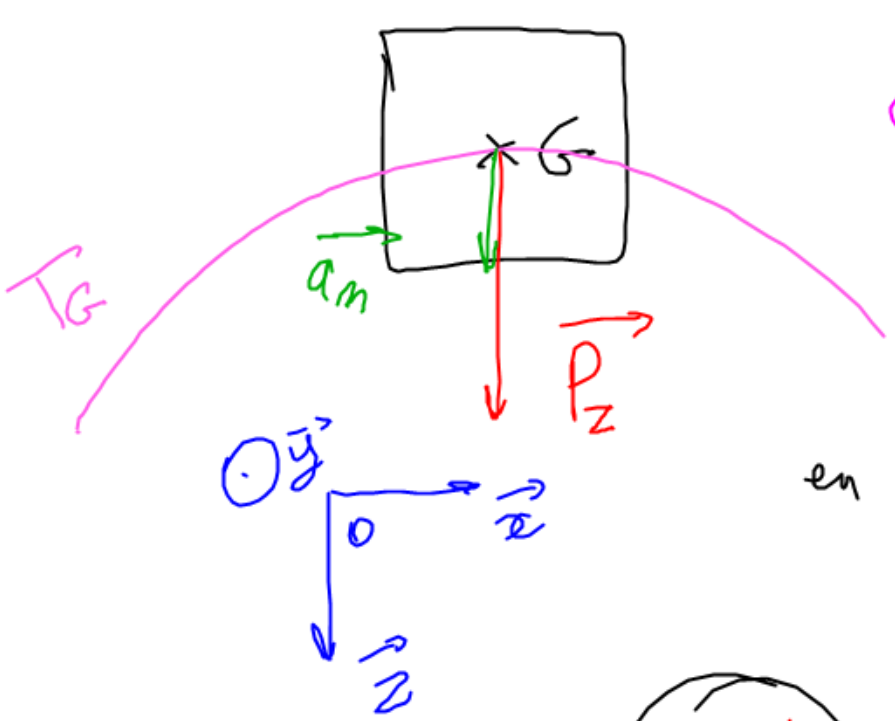
$\vec{P}$ projeté sur $\vec{x_1}$: $\vec{P}.\vec{x_1} = \vec{P}.\begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix} = -P\cos\theta$

Force, glisseur



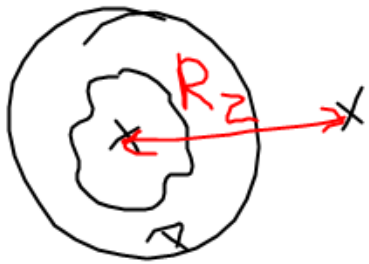
$$\sum \vec{F} = m \cdot \vec{a}$$

$$\vec{P_z} = m \cdot \vec{a}$$



$$\begin{pmatrix} 0 \\ 0 \\ m \cdot g_z \end{pmatrix} = m \cdot \begin{pmatrix} 0 \\ 0 \\ a_n \end{pmatrix} \quad \cdot \vec{x} \quad \cdot \vec{y} \quad \cdot \vec{z}$$

en proj sur $\vec{z}$: $\sum \vec{F} \cdot \vec{z} = m \cdot \vec{a} \cdot \vec{z}$



$$m \cdot g_z = m \cdot a_n$$

$$\frac{M G}{R_z^2} = \omega_{terre}^2 \cdot R_z$$

$$R_z = \sqrt[3]{\frac{M \cdot G}{\omega_{terre}^2}}$$

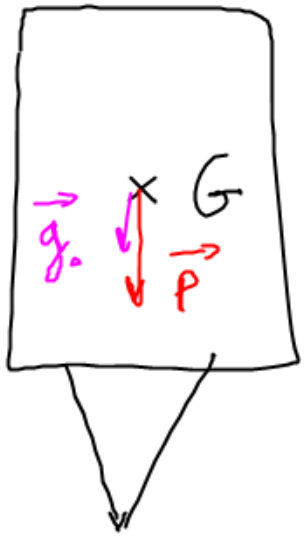
$$R_z = \sqrt[3]{\frac{5{,}972 \cdot 10^{24} \cdot 6{,}674 \cdot 10^{-11}}{(7{,}29 \cdot 10^{-5})^2}}$$

$$R_z \simeq 4{,}22 \cdot 10^7 \text{ m}$$

$$\sum \vec{F} = m \cdot \vec{a}$$

$$\vec{P} = m \cdot \vec{a}$$

$$\begin{pmatrix} 0 \\ 0 \\ -m.g \end{pmatrix} = m \cdot \begin{pmatrix} 0 \\ 0 \\ -a \end{pmatrix}$$



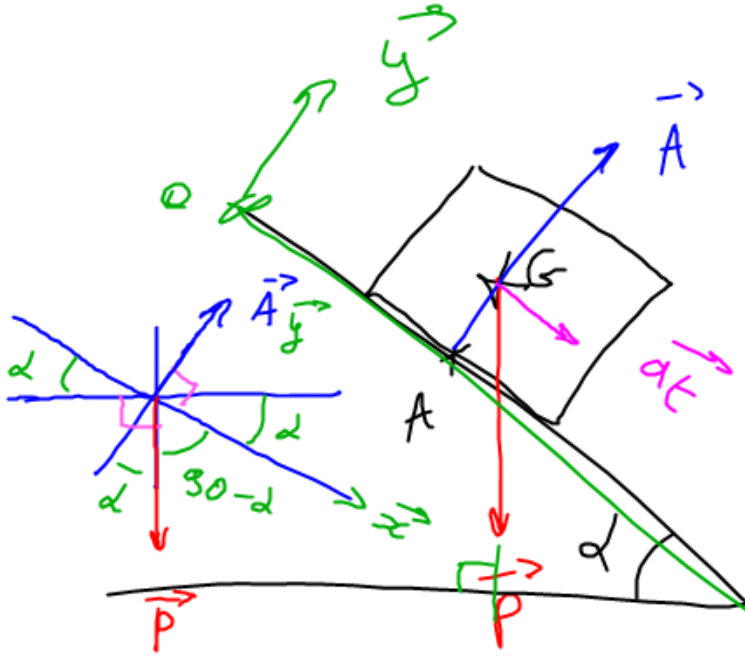
en proj / $\vec{z}$: $-m\,g = -m \cdot a$

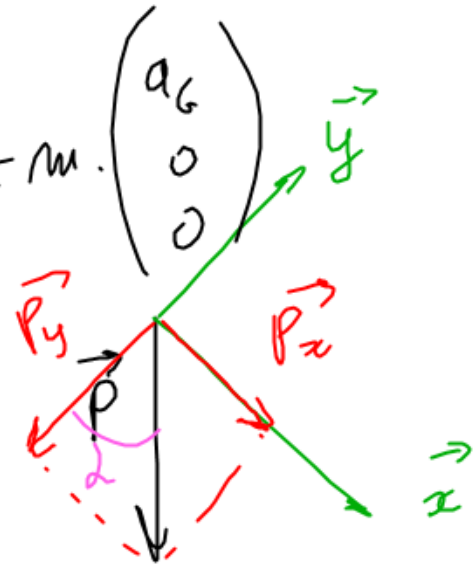
donc $a = g$

$$\sum \vec{F} = m \cdot \vec{a_G}$$

$$\vec{A} + \vec{P} = m \cdot \vec{a_G}$$

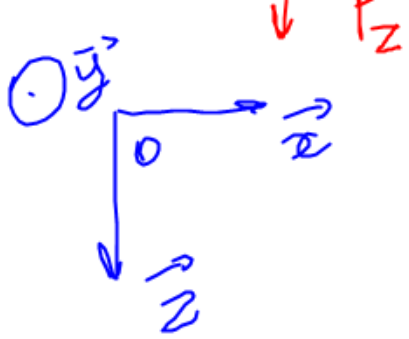
$$\begin{pmatrix} 0 \\ Y_A \\ 0 \end{pmatrix} + \begin{pmatrix} P\sin\alpha \\ -P\cos\alpha \\ 0 \end{pmatrix} = m \cdot \begin{pmatrix} a_G \\ 0 \\ 0 \end{pmatrix}$$



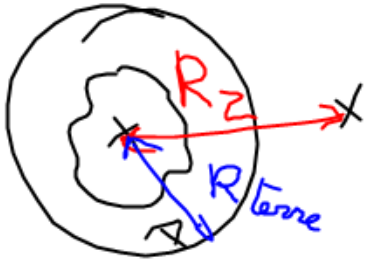


$\sum \vec{F} \cdot \vec{x} = m \cdot \vec{a_G} \cdot \vec{x}$ $(proj/\vec{x})$: $P\sin\alpha = m \cdot a_G$

$\sum \vec{F} \cdot \vec{y} = m \cdot \vec{a_G} \cdot \vec{y}$ $(proj/\vec{y})$: $Y_A - P\cos\alpha = 0$



en proj sur $\vec{z}$: $\sum \vec{F} \cdot \vec{z} = m \cdot \vec{a} \cdot \vec{z}$



$m \cdot g_z = m \cdot a_n$

$\frac{MG}{R_z^2} = \omega_{terre}^2 \cdot R_z$

$R_z = \sqrt[3]{\frac{M \cdot G}{\omega_{terre}^2}}$

$R_z = \sqrt[3]{\frac{5,972.10^{24} \cdot 6,674.10^{-11}}{(7,29.10^{-5})^2}}$

$R_z \simeq 4,22.10^7 m$

$h = R_z - R_{terre}$

$h = 4,22.10^7 - 6,378.10^6$

$\simeq 3,58.10^7 m \simeq 3,58.10^4 km$

$h \simeq 35800$ km