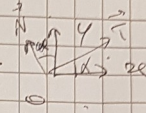


$$T \leq \mu_s N$$



$$\begin{cases} \vec{T} = T \cos \alpha \vec{u}_x + T \sin \alpha \vec{u}_y \\ \vec{N} = -N \sin \alpha \vec{u}_x + N \cos \alpha \vec{u}_y \end{cases}$$

$$\vec{a} = 0 \quad \Sigma \vec{F}_{ext} = \vec{0}$$

$$\vec{N} + \vec{T} + \vec{P} = \vec{0}$$

$$\text{sur } \vec{u}_x : T \cos \alpha - N \sin \alpha = 0$$

$$\text{sur } \vec{u}_y : T \sin \alpha + N \cos \alpha - mg = 0$$

$$\frac{T}{N} = \tan \alpha = \mu_s, \quad \mu_s = \tan 9^\circ = 0,158$$

~~$$\mu_{s+} = \tan 9,5^\circ = 0,168$$~~
~~$$\mu_{s-} = \tan 8^\circ = 0,141$$~~

~~$$\mu_{s, \text{permanent}} = 0,16 \pm 0,02$$~~

$$\Delta \alpha = \pm 0,5^\circ \quad (1/2 \text{ graduation de rapporteur})$$

$$\mu_{s+} = \tan 9,5 = 0,167$$

$$\mu_{s-} = \tan 8,5 = 0,149$$

$$\frac{0,167 - 0,149}{2} = 9 \times 10^{-3} \approx 0,01$$

$$\rightarrow \mu_{s, \text{permanent}} = 0,16 \pm 0,01$$