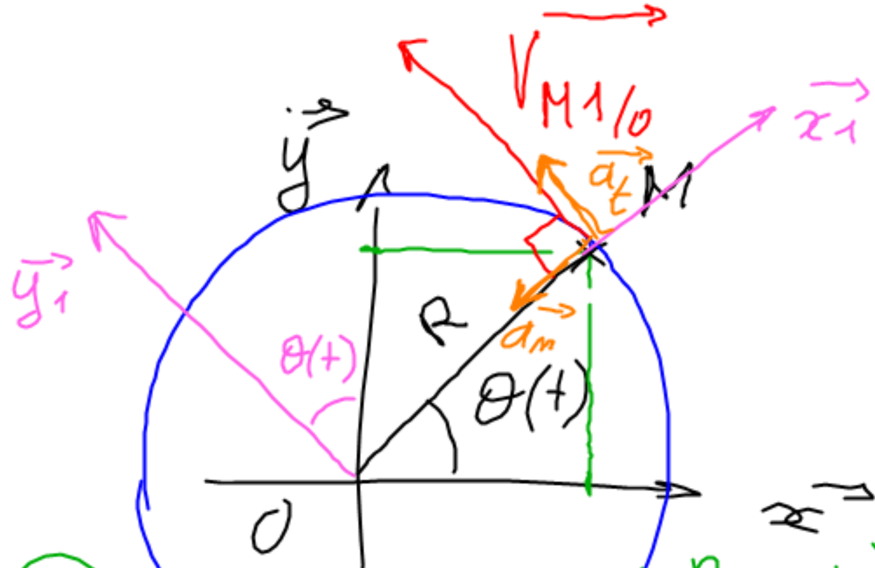


Paramétrage $\left(\begin{array}{l} R = cst \\ \theta = \text{variable} \end{array} \right)$

$R_0(O, \vec{x}, \vec{y}, \vec{z})$

$R_1(O, \vec{x_1}, \vec{y_1}, \vec{z_1})$

$$\vec{\Omega}_{1/0} = \begin{pmatrix} 0 \\ 0 \\ \omega_{1/0} \end{pmatrix}$$

$$\vec{OM} = \begin{pmatrix} R\cos\theta \\ R\sin\theta \\ 0 \end{pmatrix}_{R_0} = \begin{pmatrix} R \\ 0 \\ 0 \end{pmatrix}_{R_1}$$

$$\vec{OM} = R\cos\theta\,\vec{x} + R\sin\theta\,\vec{y}$$

$$\vec{V}_{M1/0} = \left(\frac{d\vec{OM}}{dt}\right)_{R_0} = -R.\underbrace{\dot{\theta}}_{\omega_{1/0}}\sin\theta\,\vec{x} + R.\underbrace{\dot{\theta}}_{\omega_{1/0}}\cos\theta\,\vec{y}$$

$$\vec{V}_{M1/0} = \left(\frac{d\vec{OM}}{dt}\right)_{R_0} = \left(\frac{d\vec{OM}}{dt}\right)_{R_1} + \vec{\Omega}_{1/0} \wedge \vec{OM}$$

$$= \omega_{1/0} . R\,\vec{y_1}$$

$$\overrightarrow{V_{M1/0}} = \left(\frac{d\overrightarrow{OM}}{dt}\right)_{R_0} = \left(\frac{d\overrightarrow{OM}}{dt}\right)_{R_1} + \overrightarrow{\Omega_{1/0}} \wedge \overrightarrow{OM}$$

$$= \underbrace{\left(\frac{d(R.\vec{x_1})}{dt}\right)_{R_1}}_{\vec{0}} + \omega_{1/0}.\vec{z} \wedge R.\vec{x_1}$$

$$= \omega_{1/0}.R.(\vec{z} \wedge \vec{x_1})$$

fermeture main droite

$$\overrightarrow{V_{M1/0}} = \omega_{1/0}.R.\vec{y_1}$$

$$\begin{array}{c} \begin{pmatrix} 0 \\ 0 \\ \omega_{1/0} \end{pmatrix} \\ 0 \end{array}_{R_1} \wedge \begin{array}{c} \begin{pmatrix} R \\ 0 \\ 0 \end{pmatrix} \\ R \end{array}_{R_1} = \begin{pmatrix} 0 \\ \omega_{1/0}.R \\ 0 \end{pmatrix}_{R_1}$$

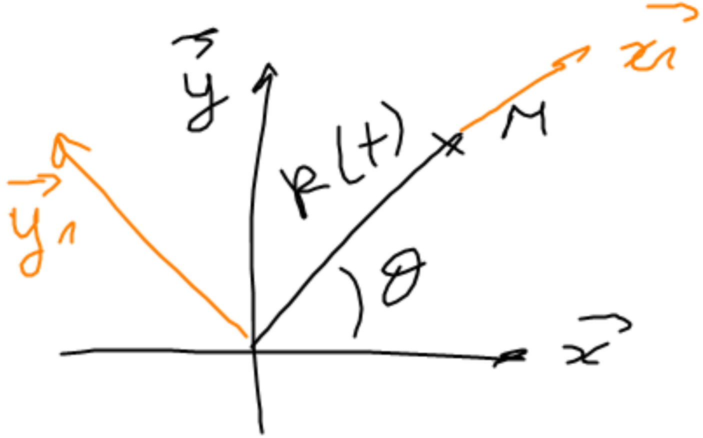
$$\overrightarrow{\Gamma_{M\,1/0}} = \left(\frac{d\,\overrightarrow{V_{M\,1/0}}}{dt}\right)_{R_0}$$

$$= \left(\frac{d\,(R \cdot \omega_{1/0} \cdot \overrightarrow{y_1})}{dt}\right)_{R_0}$$

$$= \left(\frac{d\,(R \cdot \omega_{1/0} \cdot \overrightarrow{y_1})}{dt}\right)_{R_1} + \overrightarrow{\Omega_{1/0}} \wedge R\,\omega_{1/0} \cdot \overrightarrow{y_1}$$

$$= R\,\dot{\omega}_{1/0}\,\overrightarrow{y_1} + \omega_{1/0}\,\overrightarrow{z_1} \wedge R\,\omega_{1/0}\,\overrightarrow{y_1}$$

$$\overrightarrow{\Gamma_{M\,1/0}} = \underbrace{R\,\dot{\omega}_{1/0}\,\overrightarrow{y_1}}_{\overrightarrow{a_t} = \overrightarrow{a}_{tangentielle}} + \left(-\underbrace{\omega_{1/0}^2 \cdot R\,\overrightarrow{x_1}}_{\overrightarrow{a_n} = \overrightarrow{a}_{normale}}\right)$$



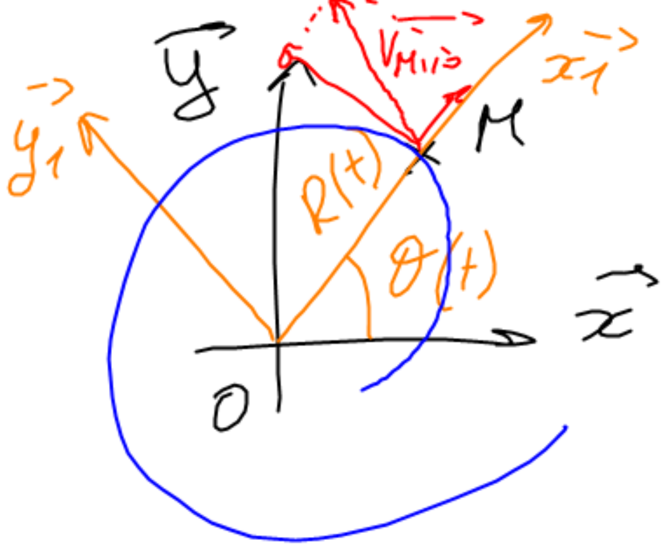
$$\vec{OM} = \begin{pmatrix} R\cos\theta \\ R\sin\theta \\ 0 \end{pmatrix}_{R_0} = \begin{pmatrix} R \\ 0 \\ 0 \end{pmatrix}_{R_1}$$

⚠ R variable
θ cst

$$\vec{V}_{M1/0} = \left(\frac{d R\vec{x_1}}{dt}\right)_{R_0}$$

$$= \dot{R}\vec{x_1} + \underbrace{\vec{\Omega}_{1/0} \wedge R\vec{x_1}}_{\vec{0}} \quad (\omega_{1/0} = 0)$$

$$\vec{\Gamma}_{M1/0} = \ddot{R}\vec{x_1}$$



$$\vec{\Omega_{1/0}} = \begin{pmatrix} 0 \\ 0 \\ \omega_{1/0} \end{pmatrix}_{\vec{z},\vec{z_1}}$$

$$\vec{OM} = R\,\vec{x_1}$$

$$\left(\frac{d\vec{OM}}{dt}\right)_{R_0} = \vec{V_{M1/0}} = \left[\frac{d\vec{OM}}{dt}\right]_{R_1} + \vec{\Omega_{1/0}} \wedge \vec{OM}$$

$$= \dot{R}\,\vec{x_1} + \omega_{1/0}\cdot\vec{z_1} \wedge R\vec{x_1}$$

$$\vec{V_{M1/0}} = \left[\dot{R}\,\vec{x_1}\right]_{R_0} + \left[\omega_{1/0}\cdot R\,\vec{y_1}\right]_{R_0}$$

$$\frac{d}{dt}$$

$$\vec{\Gamma_{M1/0}} = \ddot{R}\,\vec{x_1} + \underbrace{\omega_{1/0}\cdot\vec{z_1}}_{\vec{\Omega_{1/0}}} \wedge \dot{R}\,\vec{x_1} + (\dot{\omega}_{1/0}R + \omega_{1/0}\dot{R})\,\vec{y_1}$$

$$+ \underbrace{\omega_{1/0}\,\vec{z_1}}_{\vec{\Omega_{1/0}}} \wedge \omega_{1/0}\cdot R\,\vec{y_1}$$

$$\vec{\Gamma_{M1/0}} = \Big(\underbrace{\ddot{R}}_{\vec{a}_{linéaire}} - \underbrace{\omega_{1/0}^2 R}_{\vec{a_n}}\Big)\vec{x_1} + \Big(\underbrace{\dot{\omega} R}_{\vec{a_t}} + \underbrace{2\omega\dot{R}}_{\vec{a}_{Coriolis}}\Big)\vec{y_1}$$

$$\vec{V}_{M1/0} = \left[\frac{d\,\vec{OM}}{dt}\right]_{R_1} + \vec{\Omega}_{1/0} \wedge \vec{OM}$$

$$\vec{\Gamma}_{M1/0} = \left[\frac{d^2\vec{OM}}{dt^2}\right]_{R_1} + \left[\frac{d\,\vec{\Omega}_{1/0}\wedge\vec{OM}}{dt}\right]_{R_1} + \vec{\Omega}_{1/0}\wedge\vec{V}_{M1/0}$$

$$= \left[\frac{d^2\vec{OM}}{dt^2}\right]_{R_1} + \frac{d\,\vec{\Omega}_{1/0}}{dt} \wedge \frac{d\vec{OM}}{dt} + \vec{\Omega}_{1/0}\wedge\vec{V}_{M1/0}$$

$$\vec{u} \wedge \vec{v}$$

$$= \left[\frac{d^2\vec{OM}}{dt}\right]_{R_1} + \underset{u}{\vec{\Omega}_{1/0}} \wedge \underset{v'}{\vec{V}_M} \underset{+}{+} \underset{u'}{\frac{d\,\vec{\Omega}_{1/0}}{dt}} \wedge \underset{v}{\vec{OM}} + \vec{\Omega}_{1/0}\wedge\vec{V}_M$$

$$= \left[\frac{d^2\vec{OM}}{dt}\right] + \frac{d\,\vec{\Omega}_{1/0}}{dt}\wedge\vec{OM} + \underbrace{2\,\vec{\Omega}_{1/0}\wedge\vec{V}_M}_{\text{Coriolis}}$$