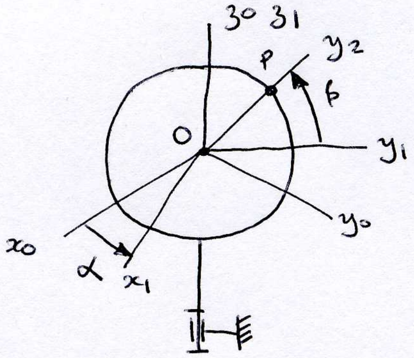
IFCI contrôle Cerceau et point



1. $\vec{\Omega}_{1/0} = \dot{\alpha}\,\vec{z_0} = \dot{\alpha}\,\vec{z_1} = \dot{\alpha}\left(\cos\beta\,\vec{z_2} + \sin\beta\,\vec{y_2}\right)$

$\vec{\Omega}_{2/1} = \dot{\beta}\,\vec{x_1} = \beta\,\vec{x_2}$

$$\vec{\Omega}_{2/0} = \vec{\Omega}_{2/1} + \vec{\Omega}_{1/0} = \dot{\beta}\,\vec{x_1} + \dot{\alpha}\,\vec{z_1} = \left|\begin{array}{l}\dot{\beta}\\ 0\\ \dot{\alpha}\end{array}\right._{1} = \left|\begin{array}{l}\dot{\beta}\\ \dot{\alpha}\sin\beta\\ \dot{\alpha}\cos\beta\end{array}\right._{2}$$

2. $\vec{OP} = a\,\vec{y_2}$

3. $$\vec{V}(P/\emptyset) = \left(\frac{d}{dt}\vec{OP}\right)_0 = \left(\frac{d}{dt}\vec{OP}\right)_2 + \vec{\Omega}_{2/0} \wedge \vec{OP}$$

$$= \vec{0} + \left|\begin{array}{l}\dot{\beta}\\ \dot{\alpha}\sin\beta\\ \dot{\alpha}\cos\beta\end{array}\right._{2} \wedge \left|\begin{array}{l}0\\ a\\ 0\end{array}\right._{2} = \left|\begin{array}{l}-a\dot{\alpha}\cos\beta\\ 0\\ a\dot{\beta}\end{array}\right._{2}$$

4. $$\vec{\Gamma}(P/\emptyset) = \left(\frac{d}{dt}\vec{V}(P/\emptyset)\right)_0 = \left(\frac{d}{dt}\vec{V}(P/0)\right)_2 + \vec{\Omega}_{2/0} \wedge \vec{V}(P/0)$$

$$= \left|\begin{array}{l}-a(\ddot{\alpha}\cos\beta) + a\dot{\alpha}\dot{\beta}\sin\beta\\ 0\\ a\ddot{\beta}\end{array}\right._{2} + \left|\begin{array}{l}\dot{\beta}\\ \dot{\alpha}\sin\beta\\ \dot{\alpha}\cos\beta\end{array}\right._{2} \wedge \left|\begin{array}{l}-a\dot{\alpha}\cos\beta\\ 0\\ a\dot{\beta}\end{array}\right._{2}$$

$$= \left|\begin{array}{l}-a\ddot{\alpha}\cos\beta + \overbrace{a\dot{\alpha}\dot{\beta}\sin\beta + a\dot{\beta}\dot{\alpha}\sin\beta}^{2\times\ldots}\\ -a\dot{\beta}^2 - a\dot{\alpha}^2\cos^2\beta\\ a\ddot{\beta} + a\dot{\alpha}^2\sin\beta\cos\beta\end{array}\right._{2}$$