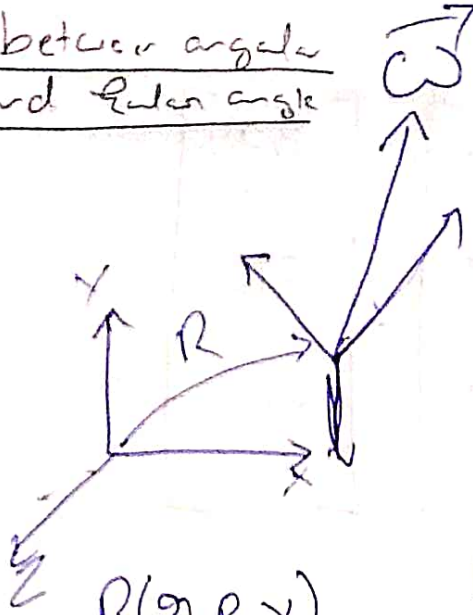
Relation between angular Velocity and Euler angle rate



$R(\gamma, \rho, \gamma)$

$$E = \begin{bmatrix} \frac{\delta \gamma}{\delta t} \\ \frac{\delta \rho}{\delta t} \\ \frac{\delta \gamma}{\delta t} \end{bmatrix} \longrightarrow \omega$$

$$\begin{bmatrix} \frac{\delta \gamma}{\delta t} \\ 0 \\ 0 \end{bmatrix} + R^{-1}(\gamma) \begin{bmatrix} 0 \\ \frac{\delta \rho}{\delta t} \\ 0 \end{bmatrix} + R^{-1}(\gamma) R^{-1}(\rho) \begin{bmatrix} 0 \\ 0 \\ \frac{\delta \gamma}{\delta t} \end{bmatrix}$$

$$\begin{bmatrix} \frac{\delta \gamma}{\delta t} \\ 0 \\ 0 \end{bmatrix} + \begin{bmatrix} 1 & 0 & 0 \\ 0 & C_\gamma & S_\gamma \\ 0 & -S_\gamma & C_\gamma \end{bmatrix} \begin{bmatrix} 0 \\ \frac{\delta \rho}{\delta t} \\ 0 \end{bmatrix} + \begin{bmatrix} 1 & 0 & 0 \\ 0 & C_\gamma & S_\gamma \\ 0 & -S_\gamma & C_\gamma \end{bmatrix} \begin{bmatrix} C_\rho & 0 & -S_\rho \\ 0 & 1 & 0 \\ S_\rho & 0 & C_\rho \end{bmatrix} \begin{bmatrix} 0 \\ 0 \\ \frac{\delta \gamma}{\delta t} \end{bmatrix}$$

$$\begin{bmatrix} 0 \\ C_\gamma \frac{\delta \rho}{\delta t} \\ -S_\gamma \frac{\delta \rho}{\delta t} \end{bmatrix} + \begin{bmatrix} -S_\rho \frac{\delta \gamma}{\delta t} \\ 0 \\ C_\rho \frac{\delta \gamma}{\delta t} \end{bmatrix}$$

$$\begin{bmatrix} -S_\rho \frac{\delta \gamma}{\delta t} \\ S_\gamma C_\rho \frac{\delta \gamma}{\delta t} \\ C_\gamma C_\rho \frac{\delta \gamma}{\delta t} \end{bmatrix}$$

$$\omega = \begin{bmatrix} 1 & 0 & -S_\phi \\ 0 & C_\theta & S_\theta C_\phi \\ 0 & -S_\theta & C_\theta C_\phi \end{bmatrix} \begin{bmatrix} \frac{\delta\theta}{\delta t} \\ \frac{\delta\phi}{\delta t} \\ \frac{\delta\psi}{\delta t} \end{bmatrix}$$

$$\begin{bmatrix} \frac{\delta\theta}{\delta t} \\ \frac{\delta\phi}{\delta t} \\ \frac{\delta\psi}{\delta t} \end{bmatrix} = \begin{bmatrix} 1 & S_\theta t_\phi & C_\theta t_\phi \\ 0 & C_\theta & -S_\theta \\ 0 & \frac{S_\theta}{C\phi} & \frac{C_\theta}{C\phi} \end{bmatrix} \omega$$