

$$\begin{bmatrix} \cos(\delta) & 0 & -\sin(\delta) \\ 0 & 1 & 0 \\ \sin(\delta) & 0 & \cos(\delta) \end{bmatrix} \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos(\beta) & \sin(\beta) \\ 0 & -\sin(\beta) & \cos(\beta) \end{bmatrix} \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$| \cos(\delta) \sin(\beta)\sin(\delta) 0 | = \cos^2(\delta) + \sin^2(\beta)\sin^2(\delta)$$

$$\begin{bmatrix} \cos(\delta) & \sin(\beta)\sin(\delta) & 0 \\ 0 & \cos(\beta) & 0 \\ \sin(\delta) & -\sin(\beta)\cos(\delta) & 0 \end{bmatrix}$$

$$| 0 \cos(\beta) 0 | = \cos^2(\beta)$$

$$| \sin(\delta) -\sin(\beta)\cos(\delta) 0 | = \sin^2(\delta) + \sin^2(\beta)\cos^2(\delta)$$

$$[1 \ 0 \ 0] \begin{bmatrix} \cos(\delta) & \sin(\beta)\sin(\delta) & 0 \\ 0 & \cos(\beta) & 0 \\ \sin(\delta) & -\sin(\beta)\cos(\delta) & 0 \end{bmatrix} = [\cos(\delta) \ \sin(\beta)\sin(\delta) \ 0]$$

$$\cos^2(\beta) = \cos^2(\delta) + \sin^2(\beta)\sin^2(\delta)$$

$$1 - \sin^2(\beta) = \cos^2(\delta) + \sin^2(\beta)\sin^2(\delta)$$

$$1 - \cos^2(\delta) = \sin^2(\beta) + \sin^2(\beta)\sin^2(\delta)$$

$$\sin^2(\delta) = \sin^2(\beta) + \sin^2(\beta)\sin^2(\delta)$$

$$\sin^2(\delta) - \sin^2(\beta)\sin^2(\delta) = \sin^2(\beta)$$

$$\sin^2(\delta)(1 - \sin^2(\beta)) = \sin^2(\beta)$$

$$\sin^2(\delta) = \tan^2(\beta)$$

$$[0 \ 1 \ 0] \begin{bmatrix} \cos(\delta) & \sin(\beta)\sin(\delta) & 0 \\ 0 & \cos(\beta) & 0 \\ \sin(\delta) & -\sin(\beta)\cos(\delta) & 0 \end{bmatrix} = [0 \ \cos(\beta) \ 0]$$

$$[0 \ 0 \ 1] \begin{bmatrix} \cos(\delta) & \sin(\beta)\sin(\delta) & 0 \\ 0 & \cos(\beta) & 0 \\ \sin(\delta) & -\sin(\beta)\cos(\delta) & 0 \end{bmatrix} = [\sin(\delta) \ -\sin(\beta)\cos(\delta) \ 0]$$

$$\cos^2(\beta) = \sin^2(\delta) + \sin^2(\beta)\cos^2(\delta)$$

$$1 - \sin^2(\beta) = \sin^2(\delta) + \sin^2(\beta)\cos^2(\delta)$$

$$1 - \sin^2(\delta) = \sin^2(\beta) + \sin^2(\beta)\cos^2(\delta)$$

$$\cos^2(\delta) = \sin^2(\beta) + \sin^2(\beta)\cos^2(\delta)$$

$$[\cos(\delta) \ \sin(\beta)\sin(\delta) \ 0]$$

$$\cos^2(\delta) - \sin^2(\beta)\cos^2(\delta) = \sin^2(\beta)$$

$$\cos^2(\delta)(1 - \sin^2(\beta)) = \sin^2(\beta)$$

$$\cos^2(\delta) = \tan^2(\beta)$$

$$[0 \ \cos(\beta) \ 0]$$

$$[\sin(\delta) \ -\sin(\beta)\cos(\delta) \ 0]$$