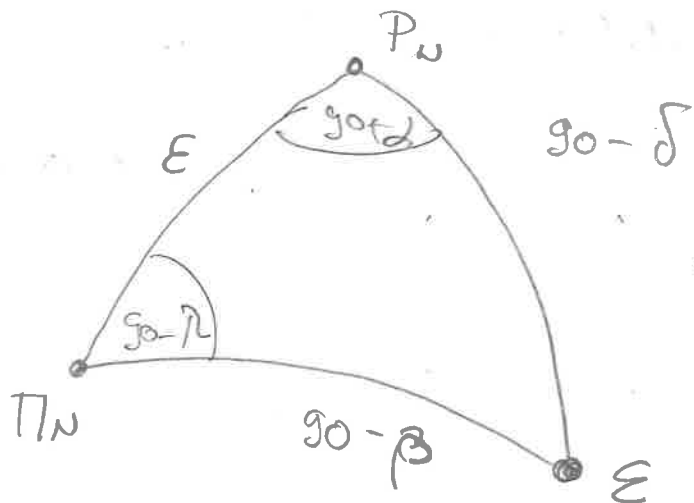


UTICAJ LUNI-SOLARNE PRECESIJE NA EKVATORSKE KOORDINATE

$$\triangle \Pi_N P_N \Sigma$$



KOSINUSNI OBRAZAC

$$\cos(90 - \delta) = \cos \varepsilon \cos(90 - \beta) + \sin \varepsilon \sin(90 - \beta) \cos(90 - \lambda)$$

$$\sin \delta = \cos \varepsilon \sin \beta + \sin \varepsilon \cos \beta \sin \lambda \quad (1)$$

SINUSNI OBRAZAC

$$\sin(90 - \beta) \sin(90 - \lambda) = \sin(90 - \delta) \sin(90 + \alpha)$$

$$\cos \beta \cos \lambda = \cos \delta \cos \alpha \quad (2)$$

DIFFERENCIRAMO (1) UZIMAJUĆI U OBZIR DA
JE $\beta = \text{const}$, $\lambda \neq \text{const}$

$$\cos \delta d\delta = \sin \varepsilon \underline{\cos \beta \cos \lambda} d\lambda \quad (3)$$

$$(2) \rightarrow (3) \Rightarrow$$

$$\cancel{\cos \delta} d\delta = \sin \varepsilon \cancel{\cos \delta} \cos \alpha d\mathcal{R}$$

$$d\delta = \sin \varepsilon \cos \alpha \underbrace{d\mathcal{R}}_{\mathcal{J}\Psi}$$

$$\boxed{d\delta = \mathcal{J}\Psi \sin \varepsilon \cos \alpha}$$

DIFFERENCIUJAMO (2) ($\beta = \text{const}$)

$$\sin \delta \cos \alpha d\delta + \cos \delta \sin \alpha d\alpha = \underline{\cos \beta \sin \mathcal{R} d\mathcal{R}} \quad (4)$$

$$\Delta \Pi_N \Pi_N \Sigma$$

SINUSNO - KOSINUSNI OBRATAC

$$\begin{aligned} \sin(90-\beta) \cos(90-\mathcal{R}) &= \cos(90-\delta) \sin \varepsilon \\ &\quad - \sin(90-\delta) \cos \varepsilon \underbrace{\cos(90+\alpha)}_{-\sin \alpha} \end{aligned}$$

$$\underline{\cos \beta \sin \mathcal{R}} = \sin \delta \sin \varepsilon + \cos \delta \cos \varepsilon \sin \alpha \quad (5)$$

$$(5) \rightarrow (4) \Rightarrow$$

$$\cos \delta \sin \alpha d\alpha = \underline{\cos \beta \sin \alpha d\alpha} - \sin \delta \cos \alpha d\delta \quad (4)$$

$$\begin{aligned} \cos \delta \sin \alpha d\alpha &= (\sin \delta \sin \varepsilon + \cos \delta \cos \varepsilon \sin \alpha) d\alpha \\ &\quad - \sin \delta \cos \alpha d\delta \end{aligned}$$

$$\boxed{d\delta = \psi \delta \sin \varepsilon \cos \alpha \quad d\alpha = \psi \delta}$$

$\Rightarrow$

$$\begin{aligned} \cos \delta \sin \alpha d\alpha &= (\sin \delta \sin \varepsilon + \cos \delta \cos \varepsilon \sin \alpha) \psi \delta - \\ &\quad - \sin \delta \cos^2 \alpha \sin \varepsilon \psi \delta \end{aligned}$$

$$\cos \delta \sin \alpha d\alpha = \psi \delta (\sin \delta \sin \varepsilon + \cos \delta \cos \varepsilon \sin \alpha - \sin \delta \sin \varepsilon \cos^2 \alpha)$$

$$\cancel{\cos \delta \sin \alpha d\alpha} = \psi \delta (\cancel{\sin \delta \sin \varepsilon} + \cos \delta \cos \varepsilon \sin \alpha - \cancel{\sin \delta \sin \varepsilon \cos^2 \alpha})$$

$$\Rightarrow \boxed{d\alpha = \psi \delta (\cos \varepsilon + \tan \delta \sin \varepsilon \sin \alpha)}$$