



$$\begin{aligned} x &= \cos(\text{lon}) \cdot \cos(\text{lat}) \\ y &= \sin(\text{lon}) \cdot \cos(\text{lat}) \\ z &= \sin(\text{lat}) \end{aligned}$$

$$\begin{aligned} \vec{u}_1 \cdot \vec{u}_2 &= \sin \varphi_1 \cdot \sin \varphi_2 + \sin \lambda_1 \cos \varphi_1 \cdot \sin \lambda_2 \cos \varphi_2 + \cos \lambda_1 \cos \varphi_1 \cdot \cos \lambda_2 \cos \varphi_2 \\ &= \sin \varphi_1 \cos \varphi_2 \left(\sin \lambda_1 \sin \lambda_2 + \cos \lambda_1 \cos \lambda_2 \right) \end{aligned}$$

$$\cos \delta = \sin \varphi_1 \cdot \sin \varphi_2 + \cos \varphi_1 \cos \varphi_2 \cdot \cos(\lambda_2 - \lambda_1)$$