$$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -\text{Sin}[\theta]\,\text{Cos}[\phi] & \text{Sin}[\theta]\,\text{Sin}[\phi] & \text{Cos}[\theta] \\ 0 & \text{Cos}[\theta]\,\text{Cos}[\phi] & -\text{Sin}[\phi]\,\text{Cos}[\theta] & \text{Sin}[\theta] \\ 0 & \text{Sin}[\phi] & \text{Cos}[\phi] & 0 \end{pmatrix} \cdot \begin{pmatrix} \gamma & \gamma\beta & 0 & 0 \\ \gamma\beta & \gamma & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix} \cdot$$

$$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & \text{Sin}[\theta]\,\text{Cos}[\phi] & \text{Sin}[\theta]\,\text{Sin}[\phi] & \text{Cos}[\theta] \\ 0 & \text{Cos}[\theta]\,\text{Cos}[\phi] & \text{Sin}[\phi]\,\text{Cos}[\theta] & -\text{Sin}[\theta] \\ 0 & -\text{Sin}[\phi] & \text{Cos}[\phi] & 0 \end{pmatrix} \text{// MatrixForm // FullSimplify}$$

$$\begin{pmatrix} \gamma & \beta\gamma\,\text{Cos}[\phi]\,\text{Sin}[\theta] & \\ -\beta\gamma\,\text{Cos}[\phi]\,\text{Sin}[\theta] & -\gamma\,\text{Cos}[\phi]^2\,\text{Sin}[\theta]^2 + \text{Cos}[\theta]\left(-1+\text{Cos}[\phi]\,\text{Sin}[\theta]\right)\text{Sin}[\phi] & -\gamma\,\text{Cos}[\phi]\,\text{Sin}[\epsilon \\ \beta\gamma\,\text{Cos}[\theta]\,\text{Cos}[\phi] & \gamma\,\text{Cos}[\theta]\,\text{Cos}[\phi]^2\,\text{Sin}[\theta] - \left(\text{Cos}[\theta]^2\,\text{Cos}[\phi]+\text{Sin}[\theta]\right)\text{Sin}[\phi] & -\text{Cos}[\theta]^2\,\text{Sin} \\ \beta\gamma\,\text{Sin}[\phi] & \text{Cos}[\phi]\left(\text{Cos}[\theta]\,\text{Cos}[\phi]+\gamma\,\text{Sin}[\theta]\,\text{Sin}[\phi]\right) & \text{Sin}[\phi \end{pmatrix}$$