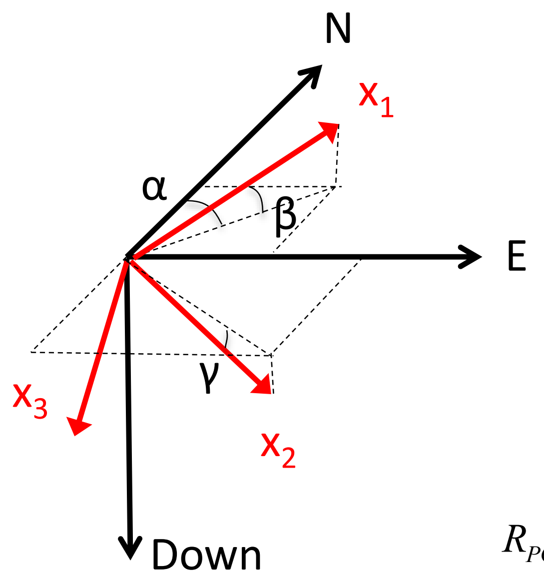

$$\underline{\underline{S'}} = \underline{\underline{A}}\,\underline{\underline{S}}\,\underline{\underline{A}}^T \qquad A = \begin{bmatrix} \underline{e'}_1 \cdot \underline{e}_1 & \underline{e'}_1 \cdot \underline{e}_2 & \underline{e'}_1 \cdot \underline{e}_3 \\ \underline{e'}_2 \cdot \underline{e}_1 & \underline{e'}_2 \cdot \underline{e}_2 & \underline{e'}_2 \cdot \underline{e}_3 \\ \underline{e'}_3 \cdot \underline{e}_1 & \underline{e'}_3 \cdot \underline{e}_2 & \underline{e'}_3 \cdot \underline{e}_3 \end{bmatrix}$$

where $\underline{\underline{A}}$ is the transformation matrix from the old base $\underline{e}_i$ to base $\underline{e'}_i$ and the components are the projection of the elements of the new base on the old base.

- Old system: N-E-D (Right-handed) Geographical system
- New system: 1-2-3 (Right-handed) Principal stress system

$$R_{PG} = \begin{bmatrix} \cos a \cos b & \sin a \cos b & -\sin b \\ \cos a \sin b \sin g - \sin a \cos g & \sin a \sin b \sin g + \cos a \cos g & \cos b \sin g \\ \cos a \sin b \cos g + \sin a \sin g & \sin a \sin b \cos g - \cos a \sin g & \cos b \cos g \end{bmatrix}$$