$$g_{ij} = \begin{bmatrix} 1 & (e_1 \cdot e_2) & (e_1 \cdot e_3) \\ (e_1 \cdot e_2) & 1 & (e_2 \cdot e_3) \\ (e_1 \cdot e_3) & (e_2 \cdot e_3) & 1 \end{bmatrix}$$

$$E = \boldsymbol{e_1} \wedge \boldsymbol{e_2} \wedge \boldsymbol{e_3}$$

$$E^2 = (e_1 \cdot e_2)^2 - 2(e_1 \cdot e_2)(e_1 \cdot e_3)(e_2 \cdot e_3) + (e_1 \cdot e_3)^2 + (e_2 \cdot e_3)^2 - 1$$

$$E1 = (e2 \wedge e3)E = \left((e_2 \cdot e_3)^2 - 1\right)\boldsymbol{e_1} + ((e_1 \cdot e_2) - (e_1 \cdot e_3)(e_2 \cdot e_3))\boldsymbol{e_2} + (-(e_1 \cdot e_2)(e_2 \cdot e_3) + (e_1 \cdot e_3))\boldsymbol{e_3}$$

$$E2 = -(e1 \wedge e3)E = ((e_1 \cdot e_2) - (e_1 \cdot e_3)(e_2 \cdot e_3))\boldsymbol{e_1} + \left((e_1 \cdot e_3)^2 - 1\right)\boldsymbol{e_2} + (-(e_1 \cdot e_2)(e_1 \cdot e_3) + (e_2 \cdot e_3))\boldsymbol{e_3}$$

$$E3 = (e1 \wedge e2)E = (-(e_1 \cdot e_2)(e_2 \cdot e_3) + (e_1 \cdot e_3))\boldsymbol{e_1} + (-(e_1 \cdot e_2)(e_1 \cdot e_3) + (e_2 \cdot e_3))\boldsymbol{e_2} + \left((e_1 \cdot e_2)^2 - 1\right)\boldsymbol{e_3}$$

$$E1 \cdot e2 = 0$$

$$E1 \cdot e3 = 0$$

$$E2 \cdot e1 = 0$$

$$E2 \cdot e3 = 0$$

$$E3 \cdot e1 = 0$$

$$E3 \cdot e2 = 0$$

$$(E1 \cdot e1)/E^2 = 1$$

$$(E2 \cdot e2)/E^2 = 1$$

$$(E3 \cdot e3)/E^2 = 1$$