

A 6.2

2014-11-17

$$\frac{\partial \rho}{\partial r_1} = \frac{1}{\sqrt{2}}$$

$$\frac{\partial \rho}{\partial r_2} = -\frac{1}{\sqrt{2}}$$

$$\frac{\partial \rho}{\partial r_3} = 0$$

$$\frac{\partial \lambda}{\partial r_1} = \frac{1}{\sqrt{6}}$$

$$\frac{\partial \lambda}{\partial r_2} = \frac{1}{\sqrt{6}}$$

$$\frac{\partial \lambda}{\partial r_3} = -\frac{2}{\sqrt{6}}$$

$$\frac{\partial R}{\partial r_1} = \frac{1}{\sqrt{3}}$$

$$\frac{\partial R}{\partial r_2} = \frac{1}{\sqrt{3}}$$

$$\frac{\partial R}{\partial r_3} = \frac{1}{\sqrt{3}}$$

$$J = \frac{\partial \varphi_i}{\partial x_j}$$

$$J = \det \begin{pmatrix} \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{6}} & \frac{1}{\sqrt{3}} \\ -\frac{1}{\sqrt{2}} & \frac{1}{\sqrt{6}} & \frac{1}{\sqrt{3}} \\ 0 & -\frac{2}{\sqrt{6}} & \frac{1}{\sqrt{3}} \end{pmatrix}^T = 1$$

Permutations act on the r_i :

$$(12): \quad \vec{\rho} \rightarrow -\vec{\rho} \quad \vec{\lambda} \rightarrow \vec{\lambda}$$

$$D((12)) = \begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$$

$$(123): \quad \rho \rightarrow \rho' = \frac{1}{\sqrt{2}} [r_2 - r_3] = \frac{\sqrt{3}}{2} \lambda - \frac{1}{2} \rho$$

$$\lambda \rightarrow \lambda' = \frac{1}{\sqrt{6}} [r_2 + r_3 - 2r_1]$$

Some indexes
got mixed up
here!

$$\begin{aligned} \frac{\sqrt{3}}{2} \lambda - \frac{1}{2} \rho &= \frac{1}{2\sqrt{2}} [r_1 + r_2 - 2r_3 - r_1 + r_2] \\ &= \frac{1}{\sqrt{2}} [r_2 - r_3] \end{aligned}$$

$$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \end{pmatrix}$$

$$D((23)) = \begin{pmatrix} 1/2 & \sqrt{3}/2 \\ \sqrt{3}/2 & -1/2 \end{pmatrix}$$

$$D((123)) = \begin{pmatrix} -1/2 & \sqrt{3}/2 \\ -\sqrt{3}/2 & -1/2 \end{pmatrix}$$

$$D((132)) = \begin{pmatrix} -1/2 & \sqrt{3}/2 \\ \sqrt{3}/2 & -1/2 \end{pmatrix}$$