

$$\text{In[18]= } \omega = \frac{1}{\sqrt{2}} (\mathbf{uu} + \mathbf{dd}) ;$$

$$\phi = \mathbf{ss} ;$$

$$\eta = \text{Cos}[\theta] \frac{1}{\sqrt{6}} (\mathbf{uu} + \mathbf{dd} - 2 \mathbf{ss}) - \text{Sin}[\theta] \frac{1}{\sqrt{3}} (\mathbf{uu} + \mathbf{dd} + \mathbf{ss}) ;$$

$$\eta \mathbf{s} = \text{Sin}[\theta] \frac{1}{\sqrt{6}} (\mathbf{uu} + \mathbf{dd} - 2 \mathbf{ss}) + \text{Cos}[\theta] \frac{1}{\sqrt{3}} (\mathbf{uu} + \mathbf{dd} + \mathbf{ss}) ;$$

In[22]=

$$\text{In[23]= } \omega \eta = \frac{1}{\sqrt{2}} \frac{1}{\sqrt{6}} * 2 \text{Cos}[\theta] - \text{Sin}[\theta] \frac{1}{\sqrt{3}} * 2 * \frac{1}{\sqrt{2}}$$

$$\phi \eta = \frac{1}{\sqrt{6}} \text{Cos}[\theta] * (-2) - \text{Sin}[\theta] \frac{1}{\sqrt{3}}$$

$$\phi \eta \mathbf{s} = \text{Sin}[\theta] \frac{1}{\sqrt{6}} (-2) + \text{Cos}[\theta] \frac{1}{\sqrt{3}}$$

$$\omega \eta \mathbf{s} = \text{Sin}[\theta] \frac{1}{\sqrt{6}} \left(\frac{2}{\sqrt{2}} \right) + \text{Cos}[\theta] \frac{1}{\sqrt{3}} \left(\frac{2}{\sqrt{2}} \right)$$

$$\text{Out[23]= } \frac{\text{Cos}[\theta]}{\sqrt{3}} - \sqrt{\frac{2}{3}} \text{Sin}[\theta]$$

$$\text{Out[24]= } -\sqrt{\frac{2}{3}} \text{Cos}[\theta] - \frac{\text{Sin}[\theta]}{\sqrt{3}}$$

$$\text{Out[25]= } \frac{\text{Cos}[\theta]}{\sqrt{3}} - \sqrt{\frac{2}{3}} \text{Sin}[\theta]$$

$$\text{Out[26]= } \sqrt{\frac{2}{3}} \text{Cos}[\theta] + \frac{\text{Sin}[\theta]}{\sqrt{3}}$$

In[27]=

$$\text{In[28]= } \frac{\phi \eta^2}{\omega \eta^2} /. \theta \rightarrow -23^\circ // \mathbf{N}$$

$$\frac{\phi \eta \mathbf{s}^2}{\omega \eta \mathbf{s}^2} /. \theta \rightarrow -23^\circ // \mathbf{N}$$

Out[28]= 0.382507

Out[29]= 2.61433

$$\text{In[30]= } \sqrt{2} // \mathbf{N}$$

Out[30]= 1.41421

$$\text{In[31]= } \text{lit} \phi \eta \omega = \frac{0.65}{1.58}$$

$$\text{lit} \phi \eta \mathbf{s} \omega \eta \mathbf{s} = \frac{0.33}{0.167}$$

Out[31]= 0.411392

Out[32]= 1.97605