

Central Forces Spherical Harmonic Series

Consider the following normalized abstract quantum state on a sphere:

$$\psi(\theta, \phi) = \left(\frac{15}{16\pi} \right)^{\frac{1}{2}} \sin(2\theta) \sin \phi.$$

This function can also be written as a series of spherical harmonics:

$$\psi(\theta, \phi) = \sum_{\ell=0}^{\infty} \sum_{m=-\ell}^{\ell} c_{\ell,m} Y_{\ell,m}(\theta, \phi).$$

1. Each group will be assigned one coefficient for this series (e.g. $c_{0,0}, c_{1,0}, c_{1,1}$) to calculate.

2. What is one thing you've learned from this activity that you want to remember?