

# PHY 480 - Computational Physics

## Project 2: Schrödinger's Equation for 2 electrons in a 3D Well

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Github Repository at <https://github.com/ThomasBolden/PHY-480-Spring-2016>

### Abstract

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## Introduction

In physics, there is a known solution to Schrödinger's equation for a single electron in a spherically symmetric three-dimensional well. However, this equation becomes more complicated when another electron is added. In addition to the energy term, there are Coulombic interactions between the electrons that must be accounted for.

For one electron, the radial part of the Schrödinger equation reads

$$-\frac{\hbar^2}{2m} \left( \frac{1}{r^2} \frac{d}{dr} r^2 \frac{d}{dr} - \frac{\ell(\ell+1)}{r^2} \right) R(r) + V(r)R(r) = ER(r) \quad , \quad V(r) = -\frac{m\omega^2 r^2}{2}.$$

## Methods

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## Results

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## Conclusions

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## Code

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## References

[1] M. Hjorth-Jensen, *Computational Physics*, University of Oslo (2013).