Homework for July 29

Write your own spherical wall code to calculate the phase shifts for the Gaussian potential in continuous space:

$$V(r) = Ce^{-\frac{r^2}{2R_0^2}}$$

$$C = -2 \text{ MeV}, \ R_0 = 2 \times 10^{-2} \text{ MeV}^{-1}$$

$$\mu = m/2, \ m = 938.92 \text{ MeV}$$

$$-\frac{1}{2\mu}\frac{d^2u}{dr^2} + \left[\frac{\ell(\ell+1)}{2\mu r^2} + V(r)\right] u(r) = Eu(r)$$