

I. COMPUTER ASSIGNMENT 1

- 1) Calculate (on a computer) all the discrete eigenvalues and corresponding wave functions of the empirical single-particle Hamiltonian for protons in $A = 208$ & $Z = 82$ using the parameters in the notes (and don't forget the Coulomb contribution). Construct the charge density of ^{208}Pb from this information and compare with experiment (Phys. Rev. Lett. 38, 152 (1977)). Assume that this charge density is similar to the one for ^{206}Pb . With this assumption construct the charge density for ^{205}Tl which has one proton less. Now Fourier transform both these charge densities and plot the ratio $\rho_{205}(q)/\rho_{206}(q)$ up to 3 fm^{-1} and "compare" to experiment (Phys. Rev. Lett. 49, 978 (1982)).

You can work in groups of at most three but at least two on this problem. I have access to the eigenvalues that you should generate. You can send me e-mail during the first and beginning of the third week that I'm gone for consultation.

Try to finish this project by Monday, October 13.