Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Helium Spectra in Atonic Mechanics ALFRED PHILLIPS, JR., SOURCE INSTITUTE — In our model of the helium atom, we postulate that the angular momentum of each electron divided by $\hbar$ equals an integer, n, plus a fraction, Δn. By minimizing the energy the energy of the helium atom, we find that the Δn values are a function of the total angular momenta, J, irrespective of the integer, n. We thus obtain a set of Δn values for the singlet and triplet states of helium. The Δn values are related to fractals. In our model, we made adjustments to the electron mass so that the calculated energy values agree with the seventeen values for the singlet *1s-ns* configurations listed in NIST Atomic Spectra Database Levels Data. The adjustments to the electron mass were usually very close to unity except for the ground state for which the adjustment was $\sim$5%. (Adjustments like these suggest that we may be able to study three-body effects with spectral accuracy.) By doing this, we had good agreement with all of the NIST spectral values for helium (191 lines of He I, and 243 lines of He II). This conceptually and mathematically simple procedure can be used for other atoms.

Alfred Phillips, Jr.
Source Institute

Date submitted: 26 Nov 2007 Electronic form version 1.4