

Abstract Submitted
for the TSF09 Meeting of
The American Physical Society

A New Skyrme Type Energy Density Functional CARSON FULS,
Texas A&M University — The quest for a modern energy density functional (EDF) with enhanced predictive power for properties of nuclei is one of the major problems in modern nuclear theory. We have recently constructed a new EDF starting with the Skyrme type EDF and taking into account effects of ground state correlations. We have used an extensive set of data on properties of nuclei in our fit to determine the parameters of the EDF. The set includes binding energy, charge rms radii, spin-orbit splitting of single-particle orbits, rms radii for valence neutrons and centroid energies for the isoscalar giant monopole resonance (ISGMR) for many different nuclei ranging from very light ^{16}O to very heavy ^{208}Pb . We have used the simulated annealing method in addition to an advanced least square method to search the hyper-surface of the Skyrme parameter space for the global minima. The new interaction named KDEX better predicts the rms radii of ^{16}O and ^{208}Pb which has been a problem in most previous interactions. Work on implementing, extension, and modification of the form of the EDF is on-going.

Carson Fuls
Texas A&M University

Date submitted: 01 Oct 2009

Electronic form version 1.4