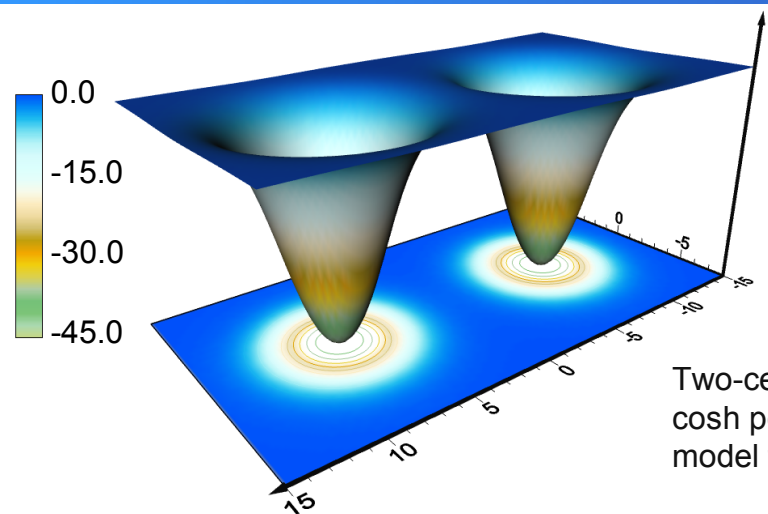


How To View The Nucleus Like A Jpeg Picture

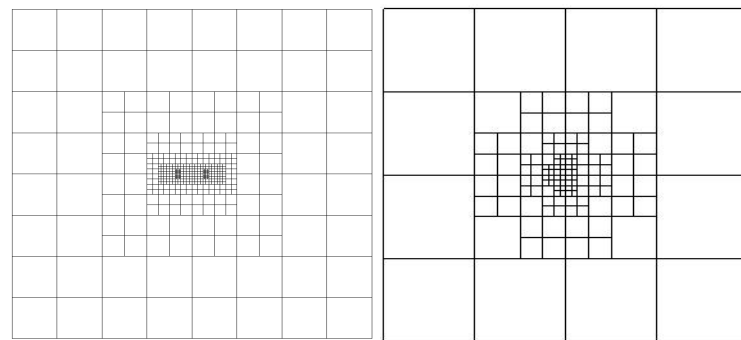


Two-centre inverted two-cosh potential: a simple model for fission or fusion

The jpeg picture format is based on the use of wavelet-based techniques to optimize compression. Adaptive 3D multiresolution methods based on wavelet expansions have been applied to describe the structure of atoms and molecules within the MADNESS framework.

Nuclear physicists, applied mathematicians and computer scientists, teamed under the SciDAC UNEDF project, have applied the MADNESS framework to solve a number of problems within the nuclear energy density functional theory.

MADNESS makes it possible to treat, in a unique formalism and with a user-defined accuracy, a plethora of nuclear phenomena as diverse as fission and fusion, involving extremely elongated shapes and evolving topologies, as well as spatially extended halo systems, and superfluidity.



Adaptive support of basis functions. A 2-D slice of the 3-D multiresolution approximation of the inverted two-cosh potential with spin-orbit term (left) and the adaptive support of one of the 3-D wave functions (right).

<http://unedf.org/>



UNEDF SciDAC Collaboration
Universal Nuclear Energy Density Functional

