Abstract Submitted
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A Cluster Model of ^{6}He and ^{6}Li[1] JEREMY ARMSTRONG, NSCL and Department of Physics and Astronomy, Michigan State University, ALEXANDER SAKHARUK, Division of Ecological Studies, Florida Gulf Coast University, VLADIMIR ZELEVINSKY, NSCL and Department of Physics and Astronomy, Michigan State University — Light nuclei provide an ideal testing ground of few-body theories. 6He is particularly interesting in that it shows an extended particle distribution similar to a halo nucleus, is loosely bound, and is a Borromean system alpha+two neutrons. We apply the Brink Formalism of multi-center shell model in secondary quantization to study the structure of 6He and close nuclei. This variational formalism gives a clear geometric picture of the many-body wave function and allows for the proper treatment of Fermi statistics and correct projection into eigenstates of angular momentum for various competing spatial configurations. The alpha plus dineutron configuration and "cigar" [(neutron, alpha, neutron)-chain] configuration were studied to obtain binding energies, charge radii, matter radii, and gamma transition probabilities for 6He. The same configurations were used to obtain the observables for 6Li and calculate the lifetime for Gamow-Teller beta decay of 6He.

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