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A microscopic hyper-spherical model: application to ^{6}He[1] IVAN BRIDA, FILOMENA NUNES, NSCL and Department of Physics and Astronomy, Michigan State University, East Lansing MI 48824 — We have developed a microscopic cluster model of light two neutron halo nuclei that incorporates the few-body asymptotics in full extent. The wavefunction of the system consists of a core and two valence neutrons. The core is given in terms of correlated Gaussians. The three-body dynamics between the core and valence neutrons are taken into account by means of the hyper-spherical functions containing an exponentially decaying hyper-radial part. The center of mass motion is removed by construction. In this talk, we present the first results of our model applied to ^{6}He. The central Minnesota N-N interaction with a spin-orbit addition is used to bind the system. Basic structural observables, such as binding relative to ^{4}He, radii and one-body densities are in agreement with other microscopic calculations employing similar N-N interactions. The microscopic description of the core allows us to test the efficiency of Pauli projection techniques employed in the few-body models. We demonstrate that proper antisymmetrization is crucial to bind ^{6}He against three-body break-up. We also present overlap functions between ^{4}He and ^{6}He with the aim of future reaction calculations.

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