

[P18] Formulation of a shell–cluster overlap integral with the Gaussian expansion method

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We formulate a computational method to evaluate the overlap integral of the shell-model and cluster-model wave functions. The framework is applied to the system of the core plus two neutrons, and the magnitude of the overlap of the shell-model configuration (core + n + n) and the di-neutron cluster one (core + 2n) is explored. We have found that the magnitude of the overlap integral is prominently enhanced when two neutrons occupy shell-model orbits with low orbital angular momenta, such as s- and p-wave orbits. The shell–cluster overlap is calculated in systems with jj-closed cores plus two neutrons, and the enhancement due to occupation of the s or p orbit also occurs in the systematic calculation. The effect of the configuration interaction on the shell–cluster overlap integrals is also discussed

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