

# Three-body systems with Lagrange-mesh techniques

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We use the hyperspherical coordinate method to study three-body systems, such as  ${}^6\text{He}=\alpha+n+n$  or  ${}^{12}\text{C}=\alpha+\alpha+\alpha$ . The system of equations is solved by using the Lagrange-mesh technique, which provides fast and accurate results. Typical examples are shown.

On the other hand, the method is applied to investigate two ways for removing Pauli forbidden states occurring in the nucleus-nucleus potentials: *(i)* the usual projection technique, and *(ii)* the use of supersymmetric partners of deep potentials. Both methods are compared for  ${}^6\text{He}$  and  ${}^{12}\text{C}$  by investigation of the spectra, wave functions, and spectroscopic properties ( $\langle r^2 \rangle, Q, B(E2)$ ).