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Correlated basis approach to nuclear five- and six-body problems

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The correlated Gaussian method is flexible to describe complex few-body dynamics, e.g., describing different types of structure and correlated motion of the particles, eliminating the forbidden components, and accurately describing the tail of the wave function in the asymptotic region. The method has been applied to not only in nuclear physics but also other quantum mechanical fields (See recent review [1]). Here we present our progress and recent application of the correlated Gaussian method for nuclear five- and six-body problems:(i) 16O as a 12C+n+n+p+p five-body model [2], and (ii) a fully microscopic six-body calculation for 6He [3].[1] J. Mitroy et al., Rev. Mod. Phys. 85, 693-749 (2013).[2] W. Horiuchi and Y. Suzuki, Phys. Rev. C 89, 011304(R) (2014).[3]D. Mikami, W. Horiuchi, and Y. Suzuki, Phys. Rev. C 89, 064303 (2014).

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