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Constructing Wave Functions for Few-Body Systems in a Hyperspherical Basis Using Parentage Scheme of Symmetrization

Content

Investigating few-body systems with identical particles in a hyperspherical basis yields the problem of obtaining symmetrized hyperspherical functions from functions with arbitrary quantum numbers. This article solves the problem of hyperspherical basis symmetrization for four-,five- ,and six- body systems using Parentage Scheme of Symmetrization. Parentage coefficients corresponding to the [4], [31], [22], [211], representations of S_4 groups, [5], [311], [221], [2111], [11111] representations of S_5 groups, and [42] and [51] representations of S_6 groups are obtained, and Young operators, acting on N = 4,5,6 body hyperspherical functions symmetrized with respect to (N-1) particles, are derived. The symmetrized N = 4,5,6 body hyperspherical functions are obtained with different values of quantum numbers . The connection between the transformation coefficients for the identical particle systems and the parentage coefficients is demonstrated and the corresponding formulas are introduced.

Early Consideration

Yes

Graduate Student

No

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