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Approximation Methods Applied to the Pullen-Edmonds Hamiltonian R.K. MURAWSKI, Drew University, J. ERICKSON, S.P. BOWEN, Chicago State University, V. FESSATIDIS, Fordham University, J.D. MANCINI, Kingsborough College of CUNY — In this work we have studied the Hamburger theorem sequence which uses the moments of the Hamiltonian evaluated for a particular state, as well as a variety of approximation schemes derivable from the t-expansion and also a Lanczos tridiagonalization scheme. Each of these calculational schemes has been applied to the well-studied Pullen-Edmonds Hamiltonian for the representation of a $2D$ isotropic harmonic oscillator with an interaction potential of the form x^2y^2. We further investigate truncated approximations from moments, matrix truncations relative to the natural $2D$ simple harmonic oscillator states $|n_x n_y >$, and a class of analytic truncations in the spirit of Feenberg perturbation theory. Each of these different approximation schemes will be compared with respect to effort, accuracy, and calculational problems.

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