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Ground state energy calculations of polynomial potentials based on Hamiltonian moments MELISSA HOFFMAN, ROBERT MURAWSKI, Drew University, JAY MANCINI, Kingsborough College of the City University of New York, VASSILIOS FESSATIDIS, Fordham University, SAMUEL BOWEN, Chicago State University — Recently, Martin et al calculated approximate energy eigenvalues for potentials of the form $V(x) = x^a + \lambda\, x^b$ by use of the multi-point quasi-rotational technique (Rev. Mex. Fis. **58**, 301 (2012)). In their paper, they considered specific values of λ and integer values of a and b. In this work, we shall apply a moments approach to study the general ground state energy of such potentials for arbitrary values of λ and for integer and non-integer values of a and b. We will compare their results against the generalized moments expansion (GMX) in terms of accuracy and computational effort. In addition, we will calculate the energy spectrum with the Lanczos tridiagonalization technique.

Robert Murawski
Drew University

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