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Moments based calculations of PT-symmetric Hamiltonians

ROBERT MURAWSKI, Drew University, JAY MANCINI, Kingsborough College of CUNY, VASSILIOS FESSATIDIS, Fordham University — PT-symmetric Hamiltonians have gained recent interest in optics and particle physics [Phys. Rev. A **82**, 031801 (2010), Phys. Rev. Lett. **105**, 031601 (2010)] . These Hamiltonians remain invariant under the reflection of parity and time. What makes them surprisingly interesting is that PT-Hamiltonians have real positive spectra. In this paper, we calculate the moments of the PT Hamiltonian $H=p^2+x^2(ix)^r$ with $r>0$. We will use these moments to compute the ground state energy by the generalized moments expansion (GMX) and the canonical sequence method (CSM). Comparisons will be made to the Lanczos tridiagonalization scheme as well as to other published results.

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