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Anharmonic Energy Spectrum for $V(x) = \pm x^4, \pm x^6, \pm x^8$ SAMUEL P. BOWEN, Chicago State University, JAY D. MANCINI, Kingsborough College of CUNY, VASSILIOS FESSATIDIS, Fordham University — In this work we wish to revisit the energy spectrum for the anharmonic potentials

$$H = \frac{p^2}{2m} \pm x^N,$$

where $N = 4, 6, 8$. Using the second quantized operator formalism of Dirac, we have evaluated matrix truncations of up to 100×100. Our results for the energy spectrum are in disagreement with the work of Bender and Boettcher (PRL 80, 5243). They studied a PT symmetric Hamiltonian whose potential is given by $V(x) = -(ix)^N$ and who maintain that "when $N \geq 2$, the spectrum is infinite, discrete and entirely real and positive". We find, for the potentials with $N = 4, 6, 8$ that the spectrum is not completely positive and in fact has no lower bound.

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