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Title: Estimates for Dirichlet Eigenvalues of the Schrödinger Operator with a PT-Symmetric Optical Potential

Abstract: We give estimates for the eigenvalues of non-self-adjoint Sturm–Liouville operators with Dirichlet boundary conditions for a shift of the special potential $4\cos^2 x + 4iV \sin 2x$ that is a PT-symmetric optical potential, especially when $|c| = |\sqrt{1 - 4V^2}| < 2$ or equally $0 \leq V < \sqrt{5}/2$. We provide some useful equations for calculating Dirichlet eigenvalues. We discuss our results by comparing them with the periodic and antiperiodic eigenvalues of the Hill operator. We even approximate complex eigenvalues by the roots of some polynomials derived from some iteration formulas. Moreover, we give a numerical example with error analysis.