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A Variational Approach To Complex Periodic Potentials With Real Band Spectra J. MIKALOPAS, F. CORVINO, J.D. MANCINI, Kingsborough College of CUNY, V. FESSATIDIS, Fordham University, S.P. BOWEN, Chicago State University — In this paper we study a class of complex PT–symmetric periodic potentials possessing real band structures. In particular we shall investigate the potentials $V(x) = i\sin^{2N+1}(x)$ $(N = 0, 1, 2, \ldots)$ which are known to have infinitely many gaps. We note for such potentials, that at the band edges there are periodic wave functions with no anti-periodic ones. We will apply a recently developed variational ansatz wherein a finite (variational) basis is constructed with respect to a variational parameter λ, according to the schema $\psi_n = \partial_\lambda^n \psi_0\,(x, \lambda)$. Comparisons are then made to both numerical analysis as well as higher-order WKB techniques.

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