

Isospectral hermitian counterpart of complex nonhermitian Hamiltonian $p^2 - gx^4 + a/x^2$

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Abstract

We show that the nonhermitian Hamiltonians $H = p^2 - gx^4 + a/x^2$ and the conventional hermitian Hamiltonians $h = p^2 + 4gx^4 + bx$ (a, b) are isospectral if $a = (b^2 - 4g^2)/16g$ and $a \geq -2/4$. This new class includes the equivalent nonhermitian-hermitian Hamiltonian pair, $p^2 - gx^4$ and $-2g/x$, found by Jones and Mateo six years ago as a special case. When $a = (b^2 - 4g^2)/16g$ and $a < -2/4$ although h and H are still isospectral, b is pure imaginary, and h is no longer the hermitian counterpart of H .

Indexed keywords

Hermitians; Non-Hermitian Hamiltonians

Engineering controlled terms: Equivalence classes

Engineering main heading: Hamiltonians