

A new class of PT symmetric Hamiltonian systems

Asiri Nanayakkara

Institute of Fundamental Studies, Hantane Road, Kandy

Ordinarily, one imposes the condition $H^+ = H$ on the Hamiltonian, where $+$ represents the mathematical operation of complex conjugation and matrix transposition. This conventional Hermiticity condition is sufficient to ensure that the Hamiltonian H has a real spectrum. However, replacing this mathematical condition by the weaker and more physical requirement $H^+ = H$ where $+$ represents combined parity reflection and time reversal PT, one obtains new class of complex Hamiltonians whose spectra are still real and positive. In this work, we have investigated the generalization of Hermiticity using new class of PT invariant complex Hamiltonians of the form $H = p^2 + ix(x^2)^{\alpha}$ where α is any rational number. We present results obtained by both classical and quantum mechanical studies of this 1-D Hamiltonian.