

Abstract Submitted
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PT-Symmetric Quantum Evolution and Logic TOREY SEMI, MARK COFFEY, Colorado School of Mines — There has been much recent interest in PT-symmetric quantum mechanics (QM) as an alternative formulation of quantum theory. We investigate the potential of this formulation for quantum computation and simulation. PT-symmetric QM replaces the usual postulate that a system's Hamiltonian must be Hermitian. It argues instead that the Hamiltonian can be symmetric with respect to combined parity and time-reversal and, for certain parametric regions, still produce real eigenvalues and maintain unitary time evolution. Besides being of fundamental interest, this approach allows for a fresh perspective on many QM applications. It is known that for one-qubit PT-symmetric systems the evolution time from an initial state to a final state can be made arbitrarily small. We report on applying PT-symmetric Hamiltonians for two-qubit systems to quantum logic.

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