

The hidden cost of computing with mixed states

Arvind

Department of Physics, IIT-Madras Chennai 600036

e-mail : arvind@quantumphys.org

This talk will focus on quantum computation using mixed states. I will review the directions in which the question "Can there be a computational advantage in using mixed quantum states as opposed to pure quantum states?" has been explored. The proposals for "scalable" implementations of quantum algorithms using mixed quantum states in an expectation-value quantum computer will be discussed. Finally, it will be shown that the ensemble implementation of the DJ algorithm based on maximally mixed states is at best as efficient as the classical random algorithm. The discrepancies will be shown to arise out of the interpretation of mixed state density matrices.