

Abstract Submitted
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Computational codes for simulating the Schrödinger equation and the Master equation¹ NAGENDRA DHAKAL, MICHAEL LEUENBERGER, University of Central Florida — We developed new codes for simulating the Schrödinger equation. We compared the codes with the FDTD codes and codes based on Quantum Monte Carlo method in 1, 2 and 3 dimensions. In addition, we simulated the Master equation for the purpose of studying the spatial and time evolution of the decoherence. Our main focus is to investigate the scalability of the codes and we found the Quantum Monte Carlo method is the most suitable for the simulation of the Master equation because it reduces the dimension of the problem to the dimension of Hilbert space, with the benefits of speeding up the process of calculation and at the same time reducing the memory. Our results are important for the implementation of quantum computing, quantum communication, and spintronics.

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Nagendra Dhakal
University of Central Florida

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