Quantum Teleportation in One-Dimensional Quantum Dots System[1] HEFENG WANG, SABRE KAIS, Department of Chemistry, Purdue University, West Lafayette, IN, 47906 — We present a model of quantum teleportation protocol based on one-dimensional quantum dots system. Three quantum dots with three electrons are used to perform teleportation, the unknown qubit is encoded using one electron spin on quantum dot A, the other two dots B and C are coupled to form a mixed space-spin entangled state. By choosing the Hamiltonian for the mixed space-spin entangled system, we can filter the space (spin) entanglement to obtain pure spin (space) entanglement and after a Bell measurement, the unknown qubit is transfered to quantum dot B. Selecting an appropriate Hamiltonian for the quantum gate allows the spin-based information to be transformed into a charge-based information. The possibility of generalizing this model to N-electrons is discussed.

Hefeng Wang

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