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Entanglement and dissipation in a quantum-dot array. LESVIA DEBORA CONTRERAS-PULIDO, Centro de Investigacion Cientifica y de Educacion Superior de Ensenada (CICESE), FERNANDO ROJAS, Centro de Ciencias de la Materia Condensada-UNAM, RAMON AGUADO, Condensed Matter Theory, ICMM, CSIC — Primarily motivated by quantum information theory, charge in quantum dots (QD) seems to be a promising candidate for implementation of qubits and entangled states [1]. We explore theoretically the dynamical formation of entangled states, including dissipative effects, of two parallel double QD uncoupled between them but strongly coupled to the same phonon thermal bath. The QD array is modeled with an extended Hubbard type Hamiltonian and dissipation is taken into account by using a polaron transformation to obtain the reduced density matrix of the system [2]. We find that it is possible to obtain entangled electronic states through a strong electron-phonon interaction, characterized by: Wootters' concurrence, charge distribution and probabilities for each Bell state as a function of relevant parameters (hopping, temperature, electron-phonon amplitude). The work is supported by DGAPA project IN114403 and CONACyT project 43673-F [1] Hichri et al., Phys.E 24,234 (2004) [2] Aguado and Brandes, Phys.Rev.Lett.92, 206601 (2004).

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