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Electron charge decoherence due to electron-phonon coupling in a semiconductor double quantum dot VASILIOS STAVROU, XUEDONG HU, Department of Physics, State University of New York, Buffalo, NY 14260-1500 — We have studied single electron charge relaxation and dephasing rates in laterally coupled GaAs double quantum dot due to electron-phonon interaction. We first calculate the single electron wavefunctions in the double dot using a basis formed by the Fock-Darwin states. For the electron-phonon interaction we include both deformation potential and piezoelectric coupling. Our results show strong dependence of the relaxation and dephasing rates on interdot distance, confinement strength, and interdot bias.

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