Quantum Method for Fault Tolerance Calculations in Quantum-dot Cellular Automata Clocked Devices IOAN STURZU, MAHFUZA KHATUN, Center for Computational Nanoscience, Department of Physics and Astronomy, Ball State University, Muncie, IN 47306 — A full basis quantum method is used for the study of the joint influence of temperature and positional defects on quasi-adiabatically clocked Quantum-dot Cellular Automata (QCA) devices. The full quantum statistical calculation is done diachronically at the level of a clocking zone in the locking phase, while the charge distribution of the other clocking zones is considered as external conditions. A full basis quantum method requires numerical calculations with large sparse matrices. Therefore, usage of some approximation techniques is needed for larger clocking zones. Using an approximation method results for thermal effect and fabrication defect properties will be shown for a wire and a shift register. The work has been supported by the Indiana 21st Century Research and Technology Fund (#04-492)

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