

# Single Electron Transistors for Molecular Computer Readout

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As semiconductor manufacturers seek to reduce power dissipation it has become apparent that CMOS alternatives may be needed to enable the next generation of low-power microprocessors. A candidate technology is called "Molecular Quantum Dot Cellular Automata" (Molecular QCA), which stores binary state in the charge configuration of a pair of coupled mixed-valence molecules. Circuits can be constructed by assembling a network of QCA cells to allow Coulomb interactions between the cells. Readout of a computation requires determining the location of a single electron within a molecule. Single electron transistors as the most sensitive electrometers available can be used to make these measurements. As a step toward realizing a molecular computer my work focuses on developing and testing single electron electrometers for this application.