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Design of a transmission gate based CMOL memory array

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Abstract: A design of a nanoelectronic memory array, compatible with both the molecular switch (nanodevice) electrical characteristics and CMOS 45 nm semiconductor technology node is presented. The proposed transmission gate based CMOL (hybrid CMOS/MOLecular) memory cell does not suffer from the operational difficulties faced by the conventional CMOL cell. The control circuitry with improved multiplexer designs is introduced, and it shows that the required voltage levels to program the nanodevices can be achieved. Moreover, the proposed memory cell has the same area as the existing CMOL inverter cell allowing easier implementation of both logic and memory circuits on the same chip.