Utilizing nonlinearity of transistors for reconfigurable chaos computation[1] WILLIAM DITTO, BEHNAM KIA, Department of Physics and Astronomy, University of Hawaii at Manoa — A VLSI circuit design for chaos computing is presented that exploits the intrinsic nonlinearity of transistors to implement a novel approach for conventional and chaotic computing circuit design. In conventional digital circuit design and implementation, transistors are simply switched on or off. We argue that by using the full range of nonlinear dynamics of transistors, we can design and build more efficient computational elements and logic blocks. Furthermore, the nonlinearity of these transistor circuits can be used to program the logic block to implement different types of computational elements that can be reconfigured. Because the intrinsic nonlinear dynamics of the transistors are utilized the resulting circuits typically require fewer transistors compared to conventional digital circuits as we exploit the intrinsic nonlinearity of the transistors to realize computations.

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