

Abstract Submitted  
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**Demonstrating Transitions between Chaos and Order in Chua's Circuit**<sup>1</sup> EDWARD HAMILTON, LUKE GROSH, LeTourneau University — Chua's circuit and the associated equation have been widely studied as a model for chaotic dynamics since their introduction in 1983. Since this circuit uses only inexpensive electronic components common in an undergraduate laboratory, it serves as an appealing introduction to the emergence of nonlinear dynamics out of a system of coupled differential equations. We constructed a Chua circuit using op-amps and resistors, and then modeled the associated behavior using computer code over a wide range of parameter space. This talk will both present the experimental circuit itself, with the intent of promoting greater use of this as an undergraduate demonstration system for nonlinear electronics, and will also explore interesting regions of the parameter space of computational results. In particular, since the numerical implementation allows for effectively infinite resolution of the physical observables, it becomes possible to demonstrate effectively fractal behavior in certain parameter regimes.

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