Abstract Submitted
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Chaotic Systems DENIS MYASISHCHEV, DAVID BIXLER, Angelo State University — Chaos theory is a current topic in physics research and is of great scientific and applied interest. Chaotic systems include weather patterns, genetic evolution and free market economics. Modeling chaotic phenomena using electronic circuits is a convenient way to analyze nonlinear systems. We have built various types of circuits and examined the conditions under which chaos occurs. Chua's circuit and analog computing circuits (ones that directly model systems of differential equations) were in the spotlight during the fall semester. An R-C phase space diagram for the Chua's circuit was constructed and the phase transitions were examined. Different analog computing circuits were built and the resulting attractors, attractor phases, and bifurcations were recorded. A mechanical system, the two block train model, is the current focus of study. The goal is to examine attractors produced by a mechanical system, a computer simulation, and a corresponding circuit in order to prove that the same experimental results can be obtained from different sources. This way if a mechanical system is too complicated to build, it can be substituted by a suitable circuit.

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