

Abstract Submitted  
for the MAR05 Meeting of  
The American Physical Society

**A quasi-dissipative and discontinuous bifurcation in an electronic circuit**<sup>1</sup> YU-MEI JIANG, Yangzhou University, YUE HE, Wuxi first middle school, JUN DAI, DA-REN HE, Yangzhou University — An electronic relaxation oscillator with over-voltage protection performs a transition simultaneously from conservative to quasi-dissipative and from continuous to discontinuous by varying a characteristic parameter. The bifurcation can produce a sudden transition of a conservative stochastic web to a transient one so that the iterations on the web escape to some conservative elliptic islands. We numerically show that a fat fractal forbidden network suddenly appears inside the original web at the bifurcation threshold. The remnant forms the transient web. The fractal exponent of the forbidden web displays an exponential dependence on the control parameter. This should be the principal rule describing the bifurcation. In addition, the dependence of the averaged lifetime of the iterations inside the transient stochastic web on the control parameter still follows the universal power law. We analytically and numerically deduced the scaling exponent.

<sup>1</sup>Supported by Natural National Science Foundation of China at Grant number 10275053

Da-Ren He  
Yangzhou University

Date submitted: 15 Nov 2004

Electronic form version 1.4