

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

A Dynamical System Having Deterministic Behavior Governed by Statistics MARTHA-ELIZABETH BAYLOR, DANA ANDERSON, Jila/University of Colorado, ZOYA POPOVIC, University of Colorado — We describe a holographic optoelectronic circuit whose dynamics to lowest order is described by a Lotka-Volterra system in which the parameters are determined by the second- and fourth- order statistical moments of a collection of input signals. The system is multistable, metastable, or monostable, depending on whether the input signal statistical fourth moments are sub-Gaussian, Gaussian, super-Gaussian, or a mixture of statistical classes. More generally the circuit gain is directly derived from the input-space statistical characteristic function. We use the dynamical properties to demonstrate the cocktail party effect in which the circuit unscrambles a mixed pair of audio or radio frequency signals in the absence of any *a priori* information about the mixture.

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Date submitted: 28 Dec 2006

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