

## Self-Organized Criticality in a Simple Neuron Model Based on Scale-Free Networks

LIN Min,<sup>1</sup> WANG Gang,<sup>2,3</sup> and CHEN Tian-Lun<sup>4</sup>

<sup>1</sup> Department of Mathematics, Ocean University of China, Qingdao 266071, China

<sup>2</sup> Institute of Oceanology, the Chinese Academy of Sciences, Qingdao 266071, China

<sup>3</sup> Graduate School of the Chinese Academy of Sciences, Beijing 100049, China

<sup>4</sup> Department of Physics, Nankai University, Tianjin 300071, China

(Received: 2005-11-23; Revised: )

**Abstract:** A simple model for a set of interacting idealized neurons in scale-free networks is introduced. The basic elements of the model are endowed with the main features of a neuron function. We find that our model displays power-law behavior of avalanche sizes and generates long-range temporal correlation. More importantly, we find different dynamical behavior for nodes with different connectivity in the scale-free networks.

PACS: 87.10.+e, 05.65.+b

Key words: self-organized criticality, avalanche, scale-free networks

[\[Full text: PDF\]](#)

Close