

Anomalous Diffusion Influence on Chaotic Systems by Observation

Sevinj Mustafayeva

Azerbaijan State Oil Academy, Baku, Azerbaijan
mustafayeva_81@mail.ru

Abstract— In report's thesis's is interacting systems new structure type Lorenz – Rossler – Anomalous diffusion. Obtained the recurrent diagrams, characterizing the features of this structure.

Keywords— observation; Lorenz – Rossler system; anomalous diffusion; nonlinear recurrent; analysis; recurrent diagrams; chaotic process

I. INTRODUCTION

As random process dynamical chaos requires statistical description. Usually measures or calculates stochastic characteristics, as stationary distribution of probability, by attractor, correlation function, power spectrums and etc. Chaotic vibrations, mathematical patterns of which are the various types of attractors, characterized by different statistical conditions and noise sensitivity degree.

In the connection with deep differences between random and chaotic systems, and consider the heterogeneity of information flour, circulating in this structures, arises their interconnection's problem [1].

This arises the question: "As stochastic component influences on chaotic process?"

As seems, that final chaotic behavior of dynamical systems is essentially independence with its arising, as activity of dynamical (deterministic) your, as existing statistical factors [2].

Besides. In last time with connection of synergetic conception's development have out, that using stochastically component's intensively can leads to as chaos increasing, such to generation of ordered structures, thus self – organizing systems and entropy's decreasing [3].

Obviously, that last connected with capacity no conservation of phase space, because that entropy can't decreases in full closed system.

This aspect very important in definition of experimental obtained observation's nature, what give, us the whereas of system's attractor condition forecasting.

Here importantly noted, that stochastic and chaotic system's interaction analyses by parametric methods have complex character, because their requires sufficient data's, or stationary sequences, which is impossible on practice.

The using of nonlinear recurrent analysis of interacted processes is good perspective, in which don't demand essential requirements to data's capacity and give satisfying results [4], [5], [6], [7]. Nonlinear recurrent analyses compares in itself visual facilities (diagrams) and power numerical apparatus (measure).

II. EXPERIMENTAL

In paper describes interacting of anomalous diffusion, fig 1, 2 with chaos – like structure, as type "Lorenz – Rossler", fig 3 for obtaining of new structures.

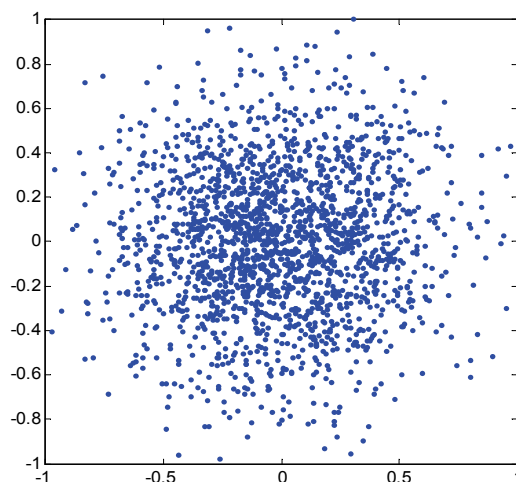


Figure 1.

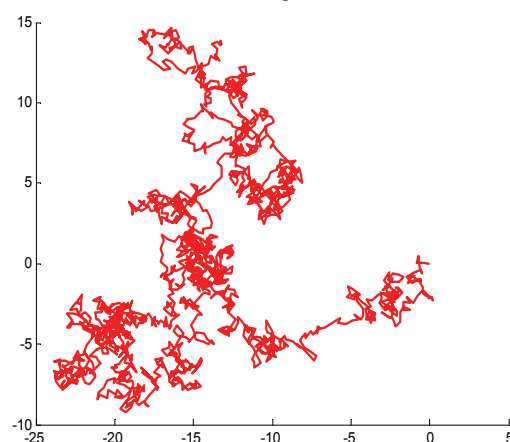


Figure 2.

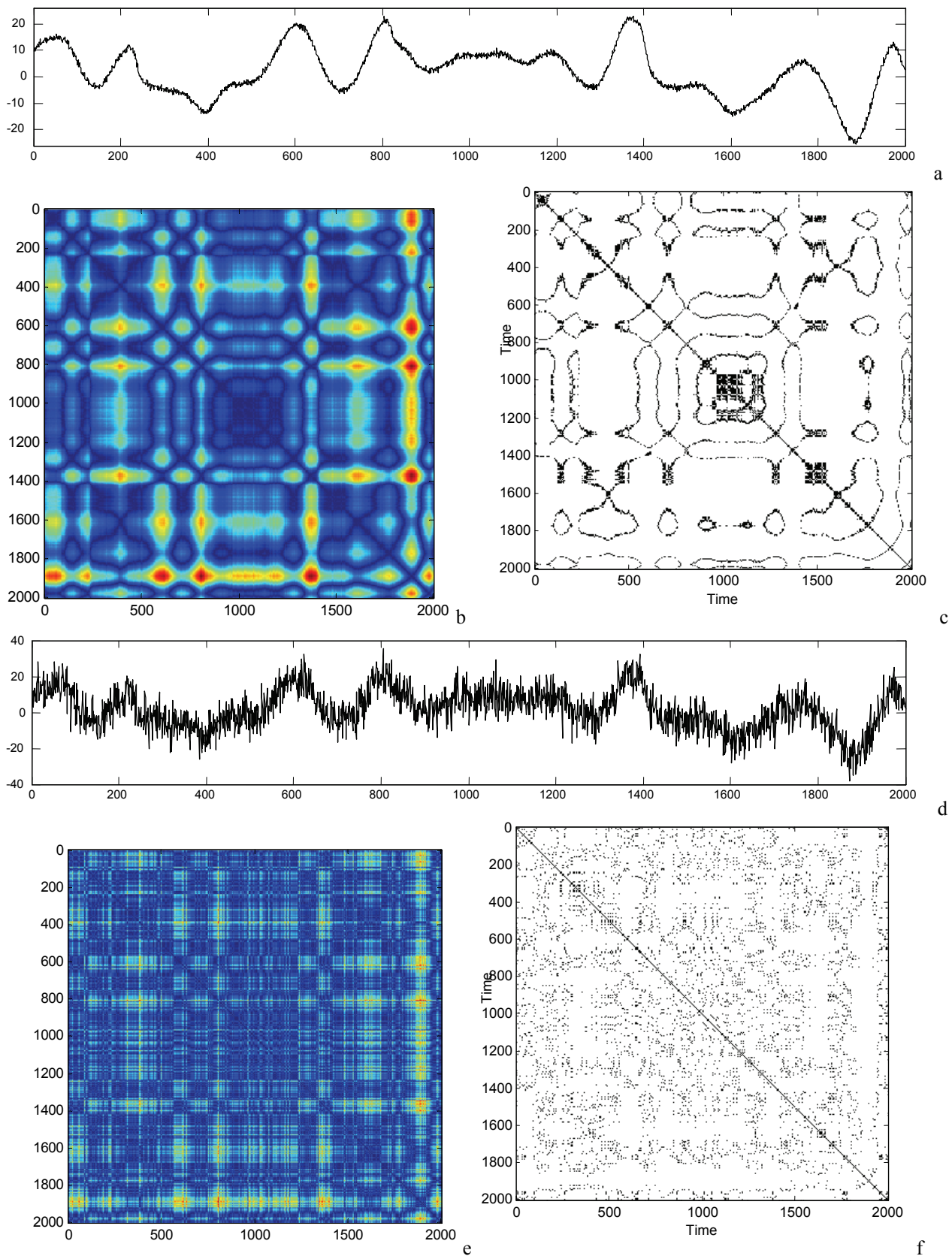


Figure 1.

Algorithm of system interacting was realized in software environment MATLAB.

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