

## ABSTRACT

Thesis explanatory note: 78 p., 10 fig., 10 tabl., 2 append., 24 sources.

APPROXIMATION, FORECASTING, FRACTIONAL BROWNIAN MOTION, MODEL, STATIONARY, STATISTICS.

Actuality of the topic - the simulation of time series is the basic process in the analysis of complex processes in most areas of human activity. Every year, the complexity of processes is increasing, which leads to the emergence of new theoretical and practical approaches in the research and simulation of time series.

The purpose of this work is to analyze existing methods of modeling and justify the new method used to study various processes (both economic and financial phenomena and natural phenomena); comparison of the proposed model with the classic.

The subject of the research - mathematical model of time series: its properties, features of construction, criteria of efficiency, advantages and disadvantages.

The object of the research is nonlinear non-stationary time series satisfying certain requirements, first of all - stationary increments, and also corresponds to the characteristics of fractal models.

The software product is implemented using the Python programming language.