

# THE SIMULATING PROGRAM OF INFORMATION TRANSFER BY MEANS OF THE CODES SUPERVISING ERRORS

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Considering the questions on working out a complex of programs in MATLAB programming system, that simulates systems of information transfer with the help of block codes that are considered to control the errors. Mathematical apparatus polynomial algebras to describe the signals and the ways of their processing are used.

*Keywords: telecommunications, signals, noise, information transfer, MATLAB, binary polynomes, noise proof coding*

## Introduction

Nowadays it is impossible to present the communication outer-space systems, the space research systems, radar-tracking systems, radio-navigating systems, reserved and even usual telecommunication systems without application of noiseproof signals coding. Each engineer working in the field of telecommunications is obliged to know methods of spectral processing, correlation processing and the co-ordinated filtration of signals.

It is well known that side by side with the lectures materials studying laboratory works play the important role in the research allowing visually to consider and comprehensively to study processes of transfer and reception of the information and the methods of struggle against hindrances and interference. From the end of 1980<sup>th</sup>, MATLAB became very popular [1,2]. MATLAB programming system often are used by engineers and scientists because of its big possibilities and relative simplicity of programming.

## Modeling of telecommunication systems

To study the process of information transfer of the codes supervising errors, in the complex of programs are used a block codes. Despite presence of huge number of functions in system MATLAB including operations with polynomial equations, it was necessary to add a class of functions with the methods, capable to carry out operation over binary polynomes. It allowed to model and consider binary signals from the polynomial view and matrix algebra that facilitates and simplifies the description and study processes of the signals. Initial signals are set by factors of binary polynomes, but with a view of control on the screen their record in the form of polynomes is deduced.

In the developed complex of programs all commands and processes of processing of signals, since the task of signals and hindrances, are set in a command window (fig.1-7) and results of their performance are displayed in an additional window (fig.8).

Interaction of the user occurs to a program complex in an interactive mode. The program prompts possible actions of the user, and in case of incorrect commands or the data specifies in errors and offers ways of their elimination.

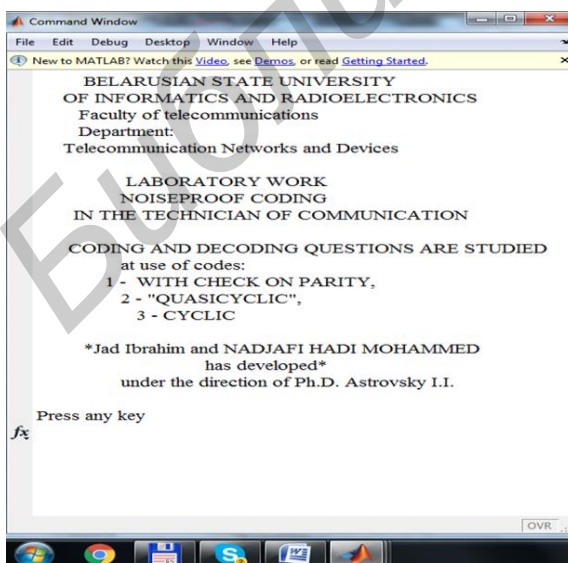


Fig. 1 Header window of the program

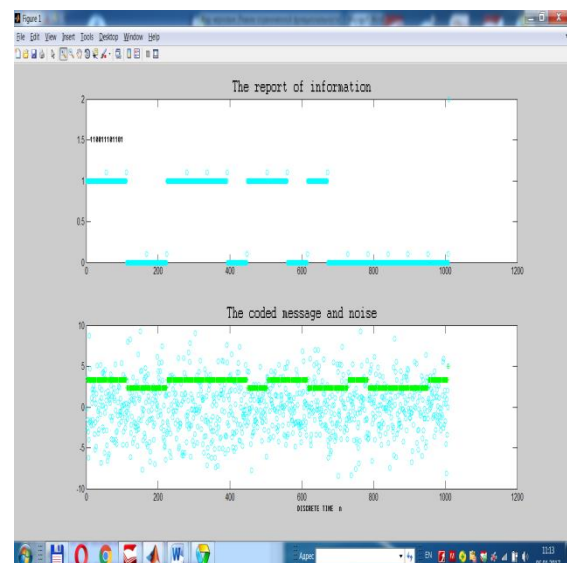


Fig. 2 Signal and mix of a signal with noises

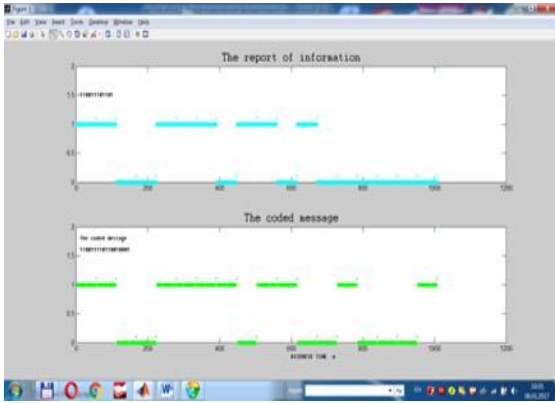


Fig. 3 Coding with parity check



Fig. 4 Matrix coding

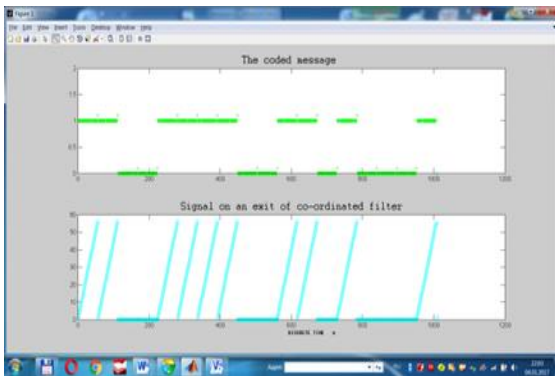


Fig. 5 Processed by means of the co-ordinated filter in the absence of noise

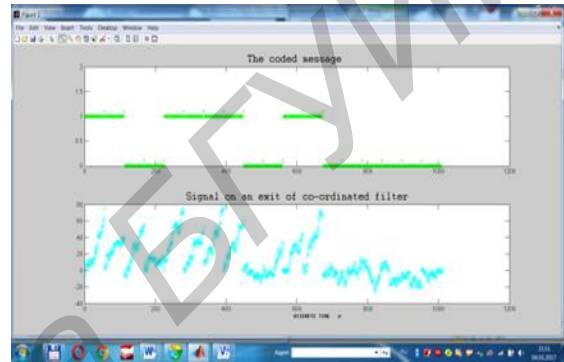


Fig. 6 Processed by means of the co-ordinated filter in the presence of noise

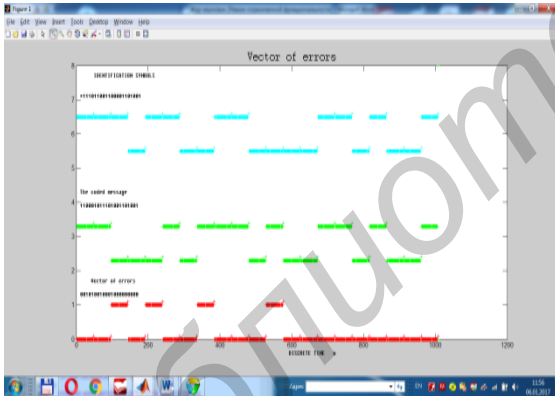


Fig. 7 Identification symbols an accepted signal at coding by noiseproof algorithms

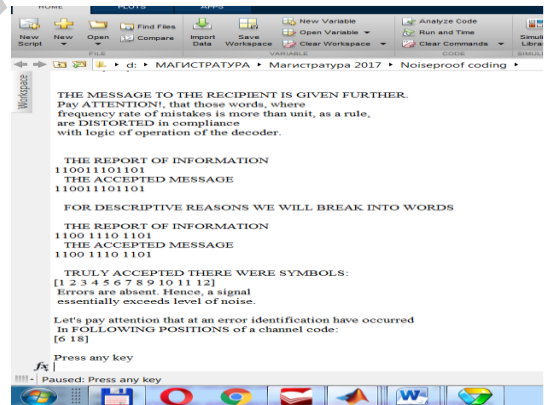


Fig. 8 Identification symbols an accepted signal at coding by noiseproof algorithms

## Conclusion

The presented screenshots show separate stages of the program, including the preliminary task, the task for performance, theoretical data and methodical instructions on work with software product. The program is supplied by its own calculator to calculate the generalized characteristics of signals and noises under the set experimental conditions.

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