

RFFI short report about 2006 researches about MTD (Russian Fundamental Investigations Fund)

For the accounting period of research the technique of multithreshold decoder (MTD) application in non-equal energy channels has been developed. It is shown, that with the help of redistribution of energy between information and check bits it is possible to approach area of effective work of MTD to the channel capacity approximately on 0,5 dB at some loss of bit-error-rate performance. This bit error-rate degradation may be compensating by using of simple concatenated code (for example, parity check code).

The technique of application of the multithreshold decoder at using of multipositional modulation (NPSK and QAM) is developed. Also the technique of multithreshold decoders efficiency improvement in such conditions is considered. It is shown, that application of the given technique allows to approach area of effective work of multithreshold decoders to the channel capacity more than on 0,7 dB.

Research of efficiency of MTD application in channels with erasures and in channels with errors and erasures is executed.

Within the diploma work at the Ryazan state radio engineering university the experimental sample of the multithreshold decoder on microcontroller ATmega48-20PI of firm Atmel is realized.

Software for optimizing parameters of the multithreshold decoder is developed and registered in ROSPATENT. The software allows to carry out optimization of parameters of the multithreshold decoder for maintenance of the best efficiency in the selected conditions.

Development of the digital channel simulator proceeds. In the current year turbo codes and low density parity check codes recommended in DVB-RCS and DVB-RCS2 standards have been build into the simulator. Besides multipath channel models named by ITU-R channel A, ITU-R channel B are realized. The given models in the near future also will be built into the simulator.

Development of the demo-test stand with the digital satellite channel simulator for research of characteristics of the send-receive equipment is conducted. Interaction of the demo-test stand with the send-receive equipment is carried out under standard protocol TCP/IP.

Specialized web-site of Space Research Institute of Russian Academy of Sciences named as www.mtdbest.iki.rssi.ru is supported. On the website the basic results of MTD development including the report for the Russian Foundation for Basic Research on results of the first year of researches are submitted.