

**Main Institute Seminar in SRI RAS**  
**"Usage of the contemporary methods**  
**of noiseproof coding**  
**in the projects of the Space researches"**

(Abstract)

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In the report the basic principles and effectiveness criteria of noiseproof coding application in problems of **high veracity for digital communication maintenance at a very large distance** are esteemed. The characteristics of the main methods of decoding of correcting codes are submitted .

Best methods by yardsticks of complexity and efficiency of correcting codes decoding now are the multithreshold decoders (MTD), about which series of the reviews is lately published.. The new reference book on MTD and others decoders was published in 2004 also. Usage of concatenating coding methods on the basis of MTD for simple and effective decoding is offered at problem solving of **a long-distant Space communication and remote sensing of the Earth (RSE)**.

New **hardware MTD** developments on special **PLIS Xilinx** are described.

The throughput of **software MTD** versions is estimated.

The necessity of coding for systems of **distant Space communication** is for a long time absolutely acknowledged. The channel energetic characteristics, **rather close to theoretically possible** for codes are now became achievable.

**The application of coding in RSE systems is necessary also.** Thus the sizes of aeriels decrease, transmission speed increases and the power of radio transmitters in RSE systems on board is reduced. Now it is easy to reach a coding gain (CG) 6-8 dB, and in some cases even more than 10 dB. It is specially important **for very popular now small Space devices** and in essence changes a view of systems of this class, allowing considerably **to improve the quality, volume and veracity of the received information.**

The capabilities of joint application of the best methods of **highly reliable source and communication channel coding** are discussed. At joint application of modern methods of this class the increase of power efficiency of transmission till 50-80 and more time is possible.

The conclusions about necessity of much more full and comprehensive usage of **the latest information theory achievements** and modern capabilities of microelectronic technologies in the Space projects of SRI RAS are done.

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An additional information **on MTD algorithms** is shown on a specialized web-site of SRI RAS: [www.mtdbest.iki.rssi.ru](http://www.mtdbest.iki.rssi.ru), and MTD presentation with **PLIS Xilinx** - at [http://www.mtdbest.iki.rssi.ru/pdf/mtd\\_xilinxengl.ppt](http://www.mtdbest.iki.rssi.ru/pdf/mtd_xilinxengl.ppt).