Diploma thesis abstract

«Multi-channel time-to-digital converter in quantum cryptography»

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The present work is devoted to the time measuring system (Time-to-Digital Converter) with picosecond accuracy. Particular attention is paid to the application of that system in the private key generation problem in quantum cryptography. Quantum cryptographic key generation experiment has been simulated, in order to find optimal parameters of the time measuring system. The paper discusses basic methods of measuring time intervals. Time-to-digital converter witch instrumental function has FWHM = 20 ps, was developed. The system can measure time intervals up to several hours. The time-to-digital converter has flexible architecture due to FPGA (field programmable gate array) used as the main logical module. This makes it possible to adapt the system to different kinds of time measuring tasks, simply by redesigning FPGA firmware.