have brought the field closer to practical implementation, but challenges remain. As we move forward, it is crucial to address these challenges to unlock the full potential of quantum communication and revolutionize the way we transmit and secure information.

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INVESTIGATION OF THE PARAMETERS OF THE OUTPUT RESPONSE OF THE PORTABLE OPTICAL COMMUNICATION SYSTEM WITH SQUARE AND CIRCULAR APERTURE OF THE LIGHT BEAM

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The most important achievements of radio electronics in the modern world are the modern radio technical systems used for signal processing and distinguished by their high complexity [1-3]. Today, research aimed at solving various problems arising during data processing and using the results of other fields of science, as well as acousto-optics, has high scientific and practical importance. In the context of the transmission of large data arrays, the relevance of the synthesis of modern technical equipment complexes, as well as of atmospheric portable optical communication systems working on the "point-to-point" principle, the development of necessary methods and tools, and the study of their operational and technical characteristics is in the focus of attention.

The portable optical communication system presented for discussion belongs to a complex of technical tools. In practice, the effect of the shapes of apertures of laser radiation sources applied to the work of optical communication systems has been proven. The results of theoretical and experimental studies conducted on the study of the parameters of the output response of the portable optical communication system with a square and circular aperture of the light beam show that the shape of the laser beam has a serious effect on the output response of the system.

It is noted that the classical application time of portable optical communication system is used when the duration of the pulse exceeds the time of intersection with the

elastic wave packet of the optical bundle. In addition, it has been proven that if the duration of the input pulse is smaller than the crossing time of the optical packet with the elastic wave packet, it can be used to expand the functional capabilities of this system. It turned out that the duration of the output pulse under these conditions is determined by the time of intersection of the optical bundle with the elastic wave packet. Expressions for calculating the pulse at the output of a portable optical communication system have been obtained through research. These provisions and regularity were confirmed by numerical reports, approved in an experimental device.

During the research, the portable optical communication system was viewed from the context of the acousto-optical processor (AOP). It is known from the theory that AOP is considered one of the priority directions for signal processing in the time domain. The processing of signals in the time domain in AOP is conditioned by the propagation of acoustic waves in a photo-elastic medium at a relatively low speed (approximately 10^5 times less than the propagation speed of electromagnetic waves (EW). EW determines the low propagation speed as well as the nature and parameters of the acousto-optic interaction, so that the elastic wave enters the optical support at this speed. In connection with the mentioned, the study of acousto-optical interaction in AOP is highly relevant in the context of their use in the performance of specific practical tasks [4-5].

As a result, it can be said that one of the main parameters of the system affecting the shape of the output signal is the diameter of the light beam, the propagation speed of the elastic wave in the photo-elastic medium, and the distance from the electroacoustic transducer to the acousto-optic interaction point. The obtained expression for the transient characteristic allows to calculate the parameters of the system response as well as the release band after a rectangular input effect.

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