

UDC 681.78: 681.7.01: 621.391.8: 519.21

STOCHASTIC-DETERMINISTIC METHODS OF SIGNALS AND IMAGES PROCESSING IN OPTOELECTRONIC SYSTEMS

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Development of theory of signals and images receiving and processing in optoelectronic systems is directed at creation methods and algorithms with taking into consideration interaction between optical irradiation and system's elements [1], [2]. Investigation of signals stochastic and deterministic properties such as energy, spatial-time, bunching, amenable to generalized limit theorems has demonstrated necessity to take into account additional statistical properties of signals in order to increase system efficiency as whole [3], [4].

Methods and algorithms of signal and images stochastic deterministic processing with aim of widening of dynamic range of optic electronic systems are submitted for consideration in the report. The methods are based on combined using of corpuscular, wave and statistical technics of signals description with taking into consideration energy and spatial-time properties of signals and interferences.

Main problems are dealt with observation of low-size and thin-contrast objects signals from which are characterized by energy subjacent below the optic electronic system sensitivity threshold. The results of theoretical and experimental studies of the developed methods of spatial-time interframe and intraframe signal processing which are able significantly improve the quality of images of movable and closely spaced objects are discussed in the report.

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2. T. A. Strelkova, «Studies on the Optical Fluxes Attenuation Process in Optical-electronic Systems», *Semiconductor physics, quantum electronics & optoelectronics (SPQEO)*, no. 4. pp. 421 – 424, 2014.
3. Т. Стрілкова, «Розвиток стохастико-детермінованої теорії прийому та обробки сигналів в оптико-електронних системах», дис. доктор., наук, КПІ ім. Ігоря Сікорського, Київ, 2017
4. Т. Стрілкова та О. Литюга, «Стохастичні моделі вихідних сигналів оптико-електронних систем» на XVII Міжнар. наук.-прак. конф. *Приладобудування: стан і перспективи*, Київ, 2018, с. 34.