ABSTRACTS

*Orkin V. V., Popov V. V., Lysenko I. V., Pyatkov V. V., Mikhailova L. A* **Determination of the composition of the dictionary of features in the recognition of spacecraft by information means of space monitoring**. **PP. 3–11.** The results of the analysis of the functioning of different types of means for monitoring near-Earth space are presented. The issues of features of recognition of space vehicles by non-coordinate information obtained by means of monitoring the near-Earth space are considered. The conditions for obtaining signs that can be obtained with the help of means of observing outer space are determined. A list of main features has been developed. **Keywords:** spacecraft, feature dictionary, recognition, non-coordinate information.

*Neelov V. V., Samorodov A. A., Protasova A. V.* **Model of radar length estimation using adaptive to signal/noise ratio operator. PP. 12–19.** The article describes a model for researching estimation radar length processing with different wavelength and objects physical size ratio. Describes method for radar length estimation using adaptive signal/noise ratio operator, allow to take into account current signal/noise ratio for choosing filtering parameters. **Keywords:** radar length, wideband radar, radar recognition, estimation of feature recognition

**ВОПРОСЫ РАДИОЭЛЕКТРОНИКИ**

### серия

**ТЕХНИКА ТЕЛЕВИДЕНИЯ**

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*Sagdullaev Yu. S., Kovin S. D.* **Three-spectral vision system for object identification.** **Pp. 20–27.** The features of the construction of three-spectral vision systems that provide the formation of signals for the identification of objects by their spectral-energy features based on the comparison of signals from neighboring zones of registration of the radiant flux of different spectral sections are considered. **Keywords:** vision systems, signal generation and processing, identification and recognition of objects by spectral and energy characteristics

*Ivanov V. G., Kamenev A. A.* **Influence of stationary noise irregularity of the signal of a matrix photodetector on the signal-to-noise ratio and the contrast sensitivity of optoelectronic means while detecting and distinguishing ground objects. PP. 28–34.** The influence of the noise non-uniformity of the matrix signal photodetector (MSP) on the signal-to-noise ratio and threshold contrast, which determines the capabilities of an optoelectronic means (OEM) for detecting and distinguishing objects in the image of the observed scene has been considered. Within approximation of the noise distribution normal law the formulas that determine the relationship of the signal-to-noise ratio at the output of the MSP with a relative unevenness of its signal have been obtained. It is shown that for reliable identification of observed objects on the ground scene image it is necessary to use MSP with a relative fixed pattern noise (FPN) of not more than 1…2%. At the same time, the use of modern methods of its compensation allows to increase the allowable FPN of the MSP signal up to 10% at simultaneous double reduction of the contrast threshold of the OEM in the mode of the observed objects identification. **Keywords:** scene image, contrast, matrix photodetector, observed object, detection, optoelectronic means, distinguishing, photosensitive element

*Ivanov V. G., Kamenev A. A.* **Possibilities of detection of man-caused space objects in the extreme infrared by optoelectronic means with matrix photodetectors based on BIB structures. PP. 35–43.** The features of the construction and operation of wide-range highly sensitive matrix photodetectors of the far infrared (IR) range based on photosensitive elements with a BIB structure, used in multispectral (аббревиатура) for monitoring man-made space objects, are considered. The capabilities of onboard (аббревиатура) with such matrix photodetectors for detection in the ultra-far IR range of low-temperature man-made space objects in the region of geostationary orbits are estimated. **Keywords:** infrared range, matrix photodetector, detection, optoelectronic means, impurity photoconductivity, man-made space object

*Kulikov G. V., Dang Xuan Khang, Starikovskiy A.I.* **Noise immunity of signal reception with amplitude-phase shift keying in the background of frequency shift keying interference. PP. 44–51.** The statistical radio engineering methods have been used to analyze the noise immunity of signal reception with amplitude-phase shift keying (APSK) with the ring structure of the signal constellation in the presence of noise and frequency shift keying (FSK) interference in the communication channel. The new dependences of the bit error probability on the signal-to-noise ratio in the radio channel, on the intensity of the interference and its frequency parameters are obtained. It is shown that the effect of FSK-interference largely depends on the ratio of its spectral parameters and the parameters of the useful signal. Such interference is more dangerous if it has a small deviation and affects the carrier frequency of the signal. With an increase in the positioning of the APSK signal, the influence of interference increases. The work is a continuation of the authors' research to assess the effect of non-fluctuation interference on the noise immunity of receiving APSK signals. **Key words**: amplitude-phase shift keying, frequency shift keying interference, bit error probability, noise immunity.

*Dvornikov S. V., Dvornikov S. S., Popov V. V.* **Evaluation of noise immunity of telecommunication signals in optical communication channels. PP. 52–57**. The article presents proposals for assessing the noise immunity of signals with position-pulse modulation in optical communication channels. An analytical expression for the bit error for signals distributed in the channel according to the Poisson law is obtained. The results of modeling under conditions of additive noise are considered. The indicator of the quality of the optical channel for the studied conditions is substantiated. **Keywords:** noise immunity of signals, position-pulse modulation, optical communication channel, bit error probability.

Dvornikov A. S., Gudkov M. A., Ayukov B. A., Fedosov A. Y., Podgorny A. V., Zasedatelev A. N., Dvornikov S. V., Kryachko A. F., Pshenichnikov A. V. **Analysis of noise immunity of transmissions with single-way modulation in channels with fluctuation interference. PP. 58–64.** The article presents the results of a comparative assessment of the noise immunity of transmissions with single-sideband modulation in relation to amplitude modulation. Analytical expressions characterizing the quantitative gain are obtained. The influence of the crest factor of the modulating oscillation on the power distribution in signals with single-sideband and amplitude modulation is considered. Numerical calculations are presented that confirm the theoretical results. **Keywords:** stability of single-sideband modulation, influence of crest factor on power distribution, generalized energy gain index of the system, channel with fluctuation noise.

Vlasenko V. I., Dvornikov S. S., Dvornikov S. V., Askerko A. V. **Efficient method of diverse reception of ionospheric radio waves. PP. 65–70**. The results of comparing the methods of diversity reception of decameter waves on paths of different lengths are presented. An analysis of the efficiency of the spatial and polarization separation of antennas under conditions of signal fading has been carried out. The dependence of the optimality conditions for the diversity method on the length of the decameter radio link path is shown. **Keywords:** spatial and polarization separation of antennas, signal fading, ionospheric channel

*Rogachev V. A.* **Checking the normal distribution of the dark signal of the photodetector. PP. 71-78**. The compliance of the distribution of the dark signal of the photodetector with the normal distribution law was checked. On the basis of the selected criteria, confirmation was obtained that the distribution of the dark current of the photodetector is normal. The conditions under which such correspondence is observed are determined. **Keywords:** normal distribution, consent criteria, trend

*Tsytsulin A. K.* **Review of the book by Y. E. Shelepin "Introduction to neuroiconics"**. **PP.** **79–89.** A comparative analysis of the concepts of vision and image processing used in the physiology and applied television is given.