ABSTRACTS

**ВОПРОСЫ РАДИОЭЛЕКТРОНИКИ**

### серия

**ТЕХНИКА ТЕЛЕВИДЕНИЯ**

**2019 вып. 1**

*Denisov A. V., Chernogubov A. V.* **Determination of image quality indicators for remote sensing systems from space. Рр. 3–9.** The process of obtaining and converting specific information from the underlying surface of the Earth from space is considered as a set of functionally and organizationally combined optical, electronic and computing facilities of the optical-electronic complex. Key indicators for assessing linear resolution in the terrain are identified. **Keywords**: optical-electronic complex, remote sensing of the Earth surface, optical system, linear resolution on the ground, system for receiving and converting information

*Logunov S. V., Chernogubov A. V., Fedorenko* *D. S.* **Modeling the process of spectrophotometry of an artificial satellite of the Earth. PP. 10–21.** The article discusses various methods for obtaining spectrophotometric information about an artificial Earth satellite. The authors proposed a simulation model of a satellite located at different distances from the ground-based optical means. With equal initial conditions of the environment, a study was made of the illumination of the developed model by solar radiation. As a result, the advantage of multicolor photometry over spectrophotometry with respect to the signal-to-noise level, selected as a criterion for evaluating modeling, was observed when observing remote satellites. **Keywords:** diffraction grating, artificial satellite of the Earth, ground optical means, color index, light filter

*Sagdullaev T. Y., Sagdullaev**Yu. S.* **Formation of signals of multi-spectral images using the integral registration method. Рр. 22–30.** The method of generating signals of multi-spectral images in information-measuring systems of multispectral television using the integral method of recording the radiant (light) flux is considered. **Keywords:** multispectral television, multi-spectral image signal generation, integral method of radiant flux registration

*Tsytsulin A. K., Devjatkin A. V., Bobrovsky A. I., Morozov A. V., Gorshanov D. L., Pavlov V. A.* **Adaption of frame rates for observation phases in the control system of a spacecraft. Рр. 31–38.** The algorithm of adaptation of frame rate at observation of space objects at big changes of range and their selection on a star background on the basis of difference of high-speed image blur is considered. **Keywords:** adaptation, frame rate, blurring, hysteresis, equation control, dichotomy

*Dvornikov S. V., Pshenichnikov A. V., Pogorelov А. А., Litkevich G. Y., Yakushenko S. A., Vlasenko V. I., Balykov A. A., Ivanov R.V., Morozov E. V., Chudakov A. M.* **Analytical model of signal damping in the decimeter range of waves. PP. 39–44.** An analytical model for calculating the attenuation of signals for decimeter television transmitters based on the interference formula, taking into account the current antenna heights, has been developed. Defined the scope of the model. Showing the prospects for its use. **Keywords:** digital television, coverage, signal attenuation model, interference attenuation formula

*Dvornikov S. V., Balykov A. A.* **Suggestions for practical implementation of the model of die insulation of the signals in the decimeter range of waves. PP. 45–50.** A program has been developed to implement an analytical model for calculating the attenuation of signals for decimeter television transmitters based on the Vvedensky formula. The results of its comparative analysis in relation to the known models are carried out. The area of its practical application is defined, recommendations are formulated. **Keywords:** digital television, coverage areas, signal attenuation model, Vvedensky formula

*Dvornikov S. V.*, *Yakushenko S. A.*, *Bolenko E. G.* **Navigational security of mobile objects and the problems of its safety. PP. 51–59.** The complexity of the architecture of the navigation support system of moving objects in the conditions of megacities is shown. An expression for calculating navigation error is presented. The concept of navigation safety is formulated and directions for its provision are defined in the interests of mobile objects and elements of a mobile television system. **Keywords:** navigation safety, navigation error, navigation support system

*Mojeiko V. I., Fissenko T. Y., Fedorov D. A.* **Digital methods for scaling images in optoelectronic surveillance systems. PP. 60–74.** Digital methods of scaling are considered for image visualization. Along with classical approaches, attention is paid to polyphase schemes the spline filter carried out in real time. The tables of coefficients of polyphase filters are provided for conversion of common image formats in optoelectronic surveillance systems. **Keywords:** resampling, interpolation, polyphase filtering, BC-Splines, Mitchell-Netravali, Catmull-Rom

*Logunov S. V., Kupriyanov N. A.*  **Ranking method of catalogued space objects used to improve the accuracy of determining the objects coordinates by long-range detection radar. PP. 75–84.** Proposed the ranking method of cataloged space objects tracked by a long-range radar. Presented the substantiation of several hierarchy criteria, allowing to rank space objects in order to obtain estimates of the state of the propagation medium in the largest volume of the viewing area. The modeling results of tracking catalogued space objects in various radar programs are presented. **Keywords:** long-range detection radar, radio signal propagation environment influence, a priori coordinate information.

*Khankov S. I., Dzitoev A. M., Lapovok Y. V.* **Infrared telescope with cryoblock. PP. 85–91.** A constructive-functional scheme of the telescope for observation through the atmosphere in the windows of its transparency in the infrared region of the spectrum is proposed. The basis of the scheme is the same for two variants of observation - from the spacecraft to the earth’s surface (remote sensing of the Earth - ERS) and from the earth’s surface to detect spacecraft. The scheme consists of two main units: the telescope itself and the cryoblock with a photodetector. Low background conditions for photosensitive elements are provided by the presence of an internal cooled screen in the cryoblock. **Keywords:** Earth remote sensing telescopes, object detection from space, detection of space objects, cryoblock with photosensitive elements, atmospheric transparency windows, infrared radiation.

*Balanin L. N.* **Writing data on a magnetic tape format LTO. PP. 92–96.** Features of data recording on a magnetic tape in the LTO format and prospects of use of drives of LTO in data storage systems are considered. The technical characteristics of tape magnetic drives of the latest developments are given. **Keywords:** magnetic tape, tape drive, recording format

*Yakovlev V. P.* **The science predictions: The centenary of Yakov Isayevich Khurgin. Рр. 97–104.** The evolution of applied science is described. The contribution of L. I. Mandelstam, N. D, Papaleksi, A. A. Andronova, S. E, Haikin, A. A. Witt, G. S. Gorelik to this direction is noted. The role of scientific school of Y. I. Khurgin is characterized. **Keywords**: applied science, methodology of mathematics and physics

*Tsytsulin A.K.* **Comments to the book about Claude Shannon. Рр. 105–113**. Important and controversial provisions in the book are noted; the contribution of the scientific school of the Institute of television to the development of the theory of K. Shannon, consisting in the principle of dominant information with its axiomatics, concepts and laws and in the equation of communication based on the concept of conjugate triads is shown. **Keywords:** information theory, communication systems, communication equation, the principle of dominant information

*Pyatkov V. V., Kovalchuk V. S., Bobrovsky A. I.* **Review on the tutorial «Ballistic fundamentals of designing of carrier rockets and satellite systems».
Рр. 114–116.**