

## CONTENTS

**Zablotsky A. V., Viryus A. A., Kaminskaya T. P., Korovushkin V. V., Kuzin A. Yu., Stepovich M. A., Todua P. A., Filippov M. N., Shipko M. N.** *Local Characteristics of Precision Alloys of Fe<sub>3</sub>(SiAl) after Magnetopulse Processing* . . . . . 2

By means of scanning electron microscopy, Messbauer spectroscopy, and some other methods the influence of the weak (10...100 kA/m) low frequency (10...20 Hz) pulse magnetic fields on the local characteristics of Fe<sub>3</sub>(SiAl) alloys was studied.

**Keywords:** scanning electron microscopy, atomic force microscopy, precision alloys, magnetic-pulse processing

**Khlopov B. V., Samoylovich M. I., Bovtun B.** *Investigation of the Multiplier Effect of Electromagnetic Fields in Proximity Devices Erasing from Electronic Media Using Nanocomposites Based on Opal Matrices* . . . . . 6

Investigate the properties of metamaterials based on samples of opal matrices for contactless devices erasing from electronic media. Developed a method for estimating the susceptibility to magnetic fields of samples of composite materials when subjected to external electromagnetic fields. The experimental results of the multiplier effect of electromagnetic fields in the system design field generator erasing at frequencies below 500 kHz. Experimentally confirmed that the frequency range up to 500 kHz electromagnetic immunity test samples varies by changing the strength of the electromagnetic field in the system design field generator erasure. The experimental characteristics of spatial multiplexing of electromagnetic fields on the semiconductor storage device. Submitted design decision to make the system field generator Erasers.

**Keywords:** nanoparticles, metamaterials, nanocomposite materials, animation, electromagnetic field, the phase velocity, thin film layer field generator system, washing device

**Amelichev V. V., Blagov E. V., Gavrilov R. O.** *Technological Characteristics of Wireless Magneto-resistive MEMS Motion Parameters* . . . . . 13

The results of experimental work on the creation of the combined technology of magneto-resistive MEMS motion parameters. The results of the study of compatibility process bulk silicon processing and formation of thin film magneto-resistive structures on a single chip. Consider the possibility of transferring the information signal magneto-resistive MEMS motion parameters over the air.

**Keywords:** wireless, beam, integrated technology, console, silicon crystal, magneto-resistive MEMS, micro-mechanical structure, magnetic field, mikromagnit, permalloy, radio channel, thin film, acceleration

**Belahurau Ya. A., Gorokh G. G., Taratyn I. A., Khatko V. V.** *Sensitive Element of Ring Gyroscope Based on Nanoporous Anodic Alumina* . . . . . 16

Technology of ring gyroscope sensitive element preparation from nanoporous anodic alumina has been developed. Modeling of the basic parameters of ring gyroscope was carried out. Resonance frequencies of the sensitive element were presented as a function of porosity and thickness of sensitive element spokes. It was shown that the output characteristics of ring gyroscope based on nanoporous anodic alumina is better than the characteristics of silicon ring gyroscope.

**Keywords:** nanoporous anodic alumina, micromechanical gyroscope modeling, finite element method

**Sergeeva A. S., Pleshkov D. N., Gorin D. A.** *Micro- and Nanostructured Photovoltaic Converters* . . . . . 20

This review presents a modern results and main tendencies of development in the field of semiconductor photoenergy converters. It is considered in detail the different structures of photovoltaic cells, their working principles, characteristics, peculiarity of fabrication technology. New directions of semiconductor photovoltaic, which are connected with the using of a photonic crystal, multilayer fibers, surface plasmon resonance structures, core-shell microparticles are discussed.

**Keywords:** photovoltaic converters, spherical solar cells, nanowires, photonic crystal, multilayered fibers, surface plasmon resonance structures

**Kernbach S.** *Exploring a High-Penetrating Capability of LED and Laser Emission. Part 2* . . . . . 28

This work explores interactions between LED/laser emitters and sensors based on electric double layers. Experiments are performed in laboratory conditions at distance of 0,25—50 meters between devices with obstacles

such as reinforced concrete steel constructions. Field experiments are performed at distance of 1,65 km. In total about 100 independent experiments with 700 measurements are performed. The second part of this work surveys performed experiments and obtained results. Attention is paid to minimizing and removing such factors as variation of temperature and EM fields, light, acoustic and mechanical impacts from influence on the results. We consider the hypothesis about a high-penetrating component of the emission as well as its application in development of microsensors for deep-water emergency communication systems.

**Keywords:** underwater communication systems, LED/laser emission, sensors based on electric double layers, high-penetrating component of the emission

**Baturin A. S., Spiridonov M. V., Negrov D. V., Kuzin A. A. Concentrated output Cavity of the Mircroklystron at Millimeter Wave Range . . . . . 39**

An approach to construction of millimeter wave lumped resonator is proposed. Such resonator can be used as ultimate cavity in mm-wave klystron. The method and results of structure simulation are presented. Technological aspects of structure formation are discussed.

**Keywords:** amplifier, millimeter wave radiation, resonator, klystron, finite difference time domain method

**Platonov V. V., Generalov S. S., Smehova M. I., Amelichev V. V., Polomoshnov S. A. Electrostatic Memswitchon Silicon — Glassstructur. . . . . 43**

Considered the main advantages of MEMS switches. Shows the results of realization the construction of SOI with movable electrodes on consoles hasno in the technology of removing the sacrificial layer. Presents the main results of the study developed by MEMS switches.

**Keywords:** MEMS switch, the electrostatic actuator, operating voltage, metal aluminum

**Mosin O. V., Ignatov I. I. The Natural Photo-Transforming Photochrome Transmembrane Protein Nanomaterial Bacteriorhodopsin from Purple Membranes of Halobacterium Halobacterium Halobium . . . . . 47**

The article presents the technology of microbiological synthesis of natural photo-transforming photochrome transmembrane protein bacteriorhodopsin (output 8...10 mg), which is capable to transform light energy to electro-chemical energy of generated protons H<sup>+</sup> and adenosine-5-triphosphate (ATP). These data are important for nano-industry of new modern domestic photo-transforming nanomaterials on the base of bacteriorhodopsin and molecular bioelectronics.

**Keywords:** Halobacterium halobium, purple membranes, bacteriorhodopsin, biosynthesis, biomolecular electronics

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