

ческой совместимости углеродных наноструктур с клетками фибробластов китайского хомячка линии V-79. № 6.

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Соборовер Э. И., Кряжев С. А. Разработка бифункциональной акустооптической измерительной ячейки сенсорного типа для физико-химических и медико-биологических исследований нанопленок (технология "Lab on Chip"). Часть 1. Конструкция, сочетающая измерения на поверхностно-акустических волнах и в режиме многократного поглощения и отражения света. № 2.

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Sol-gel techniques for preparation of ferroelectric barium-strontium titanate nanostructures with the aspect ratio of 1:10 and more in alumina matrix are developed. It is shown by electron microscopy, that crystallization in the pore matrix leads to formation of nanotubes or nanoroads with the diameter of 100–200 nm and with the length up to a few microns formed by barium-strontium titanate crystals with the size of 3–100 nm.

Keywords: TEM study, sol-gel method, nanostructures, crystallization.

Lyubimsky V. M. *The Temperature Dependence of the Bend of the Long Rectangular Two-Layer Plate* 6

A system of the differential equations which describes the influence of the temperature on the bend of a long rectangular two-layer plate is obtained. This made possible the investigation of the temperature dependence of deflections, deformations, mechanical stresses under various conditions at the edges of the plate. Exact solutions of the system of the differential equations were obtained for free, rigidly jammed plate edges and for the plate freely rest on the bottom surface. The good agreement was found between experimental and theoretical results.

Keywords: long composite rectangular plate, temperature-deflection, deformation, stress.

Mukhurov N. I., Efremov G. I., Zhvavyi S. P. *An Elastic Elements in Microelectromechanical Systems*. 12

Are considered MEMS a plane-parallel design. The design procedure and the analysis of the deformed condition of the rotors containing elastic holders and anchors, in MEMS wide functional purpose are offered. Variants of rotors of constant and step performance with articulate and rigid support are designed and compared. The data allowing operatively to determine geometrical factors, necessary for development MEMS with the set parameters are submitted.

Keywords: microelectromechanical systems (MEMS), plane-parallel construction scheme, rotor constant and stepped section, support, active force, reactive force, elastic element, formula elastic lines.

Kazaryan A. V., Balakshy V. I. *Dynamic Stability in a Nonlinear Acousto-Optic System with a Distributed Delayed Feedback*. 22

Dynamic stability in a nonlinear acousto-optic system with a distributed delayed feedback is considered theoretically. A mathematic model of the system is proposed and analyzed which takes into account inertia of an optoelectronic part of the feedback channel, signal delay in the direct conversion channel as well as the distributed character of acousto-optic interaction. Limits of the system dynamic stability are determined for different values of parameters.

Keywords: acousto-optic interaction, feedback, dynamic stability, Bragg regime of diffraction.

Babayevsky P. G., Reznichenko G. M., Zhukov A. A., Zhukova S. A., Grinkin E. A. *Electromechanical Transducers of Sensor Micro- and Nanosystems: Physical Foundations and Scaling Effects. Part 2. Detectors, Noise Sources and Characteristics*. . . 27

In the second part of the review devoted to analytical presentation of capacitive, piezoelectric, opto-integrated, and electron tunneling detectors of mechanical motion in NEMS transducer elements it is shown that tunneling detectors are most pro-

misg. However, side physico-chemical (adhesion and capillary) effects and forces begin to act significantly in these detectors. Different fluctuation processes such as thermomechanical and temperature fluctuation, adsorption/desorption processes in the sensing mechanical elements and electrical fluctuation processes in tunneling detectors begin playing a significant role at the transition to nanoscale as well. These processes determine mostly noise character and magnitude and, respectively, sensitivity and resolution of sensor NEMS.

Keywords: sensor MEMS, NEMS, electromechanical transducers, detectors, physical foundations, scaling effects, sensitivity, resolution, power spectral density.

Adamov D. Yu. *Synchronization, Communication and Noiseproof Features for Information Network Integrated Circuits* 38

The noiseproof feature is the main factor, which limits processing speed for information system VLSIC. This article describes the new methods of synchronization and data transmission for IC design, which is needed for nanometer technology base. System level approaches have to be used for chip level design such as signal equalization, serial data transmission and block synchronization etc.

Keywords: oscillator, synchronization, noiseproof, information networks, acceptable deviations, signal integrity, equalization, ring oscillator, clock tree, system on chip, system in package, nanometer technology.

Baranochnikov M. L., Leonov A. V., Mokrushin A. D., Mordkovich V. N., Omelianovskaia N. M., Pazhin D. M.

The Peculiarities of Characteristics of Sol Field Effect Hall Sensor with Double Gate Control Metal—Dielectric—Semiconductor—Dielectric—Metal System 45

The dependences of channel current and Hall emf from potential on control gates of SOI field effect Hall sensors with double gates control system MOSOM type was measured. It was demonstrated the possibility to control FEHS characteristics by separate or coincidence variations of gates potentials.

Keywords: field effect Hall sensor, SOI structure, MOS transistor, double gate control system, channel current-gate and Hall emf — gate characteristics.

Yashin K. D., Terpinskaya T. I., Osipovich V. S., Lemesh R. G., Kulchitskiy V. A. *Cell Imaging Nanobiosemiconductor System* 48

Nanobioinformation technologies are one of roughly developing scientific directions of the XXI century. Developers of microsystem technical equipment actively cooperate with experts from medical institutions. Especially it concerns oncological diseases, which remain till now the big problem all over the world. In this research work the design and technology of production of experimental nanobioinformation system, constructed with application of semiconductor nanocrystals, is submitted. Development is intended for the visualization of cells and cellular components in medical diagnostics.

Keywords: nanobiosemiconductor system, cell imaging, cell culture, fluorescent semiconductor nanocrystals, photoluminescence.

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