

CONTENTS

Kostsov E. G., Baginsky I. L., Bukhanets D. I., Kasheev E. L.
Electrostatic motor for High-Speed Micromechanics Devices 2

The investigation of a planar step petal micromotor was carried out aimed to its possible applications in high-speed micromechanical devices (microsecond range). It was shown that the characteristics reached for this motor: high-speed action — up to tens microseconds, low control voltages — tens volt, high spatial resolution — the steps up to 10 nm allow one to apply them in precision micromechanical devices, including positioners.

Skalon A. I. *Development Principles of Construction Micromechanical Sensors of Primary Information an Integral Balancing with Usage Optoelectronic and Electromagnetic Elements* 7

The problems of development new type microminiature and micromechanical sensors of primary information (SPI) for measurement of mechanical values are esteemed. SPI are work in a dynamic behaviour and constructed on the basis of electromechanical systems of a compensatory type. The engineering solutions mirror the concept of construction SPI, working in a mode of self-oscillations. A feature of these solutions is usage new for micromechanical and microminiature SPI of optoelectronic and electromagnetic elements. The physical analogs, skeleton diagrams and mathematical models are designed. The design techniques and manufacturing of elements sensors with allowance for features of master schedules are reviewed, which one will be used at creation micromechanical and microminiature SPI.

Shahtsukov A. G., Zagidulin Yu. S. *The Modeling of the Transient Enhanced Diffusion Process in Ion-Implanted Layers* 12

In ion-implanted layers under post implantation annealing the redistribution of introduced admixture occurs as a result of transient enhanced diffusions (TED). The theoretical model of TED factors has been presented of prior implantation admixture taking into account unequal distribution of radiation defects and their recombination according the time for thermal and photon annealing. The method of calculation of admixture redistribution has been presented in the case of coordination-time dependency of diffusion factor. The process TED has been modulated by the example of formation of real alloyed layers, having been used in the production of electronic techniques devices. The good accordance of accounting and experimental data has been shown.

Afanas'ev A. M., Chuev M. A., Medvedev P. G., Pustovoi V. I.
On Limiting Resolution of Apodized Diffraction Filters 17

The way of abrupt enhancement of resolution of optical and ultra-sound diffraction filters is found. A realization of the method is based on choosing the corresponding apodizing functions. The results supplies wide perspectives for substantial increasing in the resolution of optical spectrometers, improvement of characteristics of mobile devices and denseness of connection channels, as well as they should be taken into account in the prognostication of developments in the corresponding technical fields.

Sinjutin S. A. *The Intellectual Generator for Registration of the Infrequent Events* 21

The different variants of the generators with the built-in electronics for the fixing of the infrequent events — impulse speeding up (impacts) are considered.

Bakhtizin R. Z., Wu K.-H., Xue Q.-Z., Xue Q.-K., Nagao T., Sakurai T. *Scanning Tunneling Microscopy Study of Ag Film Initial Stages Growth on a GaN(0001) Surface* 26

Ag adsorption and the initial stages of Ag film growth on a gallium-rich GaN(0001) surface have been studied using STM under ultra-high vacuum condition. It has been shown a drastic change of the Ag growth mode on the bulk-terminated GaN(0001) surface, from a Stranski-Krastanov growth at low flux (0.8 ML/min), to a novel layer-by-layer growth at a higher flux (1 ML/sec). Based on this finding we show a new approach for obtaining flat epitaxial Ag film on the GaN(0001) surface at room temperature, by applying high Ag flux rate to suppress the atom diffusion. We also report the first observation of a novel unreconstructed Ag-terminated GaN(0001)-1 × 1 and explain its structural model.

Valiev K. A., Bocharov L. Ju., Maltsev P. P., Troitsky I. I.
Quantum Technology is the New Aspects of Nanotechnology 30

The basis foreign plans in the area of quantum technology which one may to estimate as the new step of the nanotechnology development are considered and some achievements in this area reduced; and also the examples of the quantum cryptography are described.

Frolov V. D., Zavedeev E. V., Pimenov S. M., Konov V. I.
Micropscopic Properties of Thin Films on the Base of Ni—C nanocomposites 36

The work reports on Scanning Probe Microscopy (SPM) of electrical and magnetic properties of thin (~30 nm in thickness) Ni—C nanocomposite films. The films were prepared on Si substrates by cosputtering Ni and graphite, and subsequent thermal annealing in vacuum at 400 °C that led to a self-assembly of Ni-filled carbon nanocapsules (~5 nm in size) uniformly dispersed in the film.

Altshuller G. M., Vaks V. L., Gaikovich K. P. *Microwave Subsurface Imaging of Subsurface Structure of Living Tissues* 39

The microwave 2D images of the subsurface structure of living tissues (of the human thorax) have been obtained using a near-field small-aperture antenna as a probe. The microwave reflection at the frequency 1110 MHz has been measured by 2D scanning over the body surface by a registering device, stored in a computer and used to produce an image, where subsurface dielectric inhomogeneities are clearly seen.

Reznik A. N., Yurasova N. V. *Subsurface Thermometry of Biological Tissues by Means of Near-Field Microwave Sounding* 42

We have studied prospects of microwave near-field sounding as applied to subsurface temperature diagnostics of biological tissues. An integral relation has been obtained which is a basis for inverse problem. Measuring frequency response of the near-field system allows retrieval of the inner temperature profiles. An antenna complex providing the temperature diagnostics to within 0.4 °C at a depth of 5 cm inside the tissue has been developed.

For foreign subscribers:

Joint-stock company MK-Periodica. E-mail: info@periodicals.ru; Tel.: +7(095) 284-5008. Fax: +7(095) 281-3798

The journal bought since november 1999.

Editor-in-Chief Ph. D. Petr P. Maltsev

ISSN 1684-6419.

Address is: 4, Stromynsky Lane, Moscow, 107076, Russia. Tel./Fax: +7(095) 269-5510.

E-mail: it@novtex.ru; <http://www.microsystems.ru>

Адрес редакции журнала: 107076, Москва, Стромьинский пер., 4. Телефон редакции журнала (095) 269-5510. E-mail: it@novtex.ru

Журнал зарегистрирован в Государственном Комитете Российской Федерации по печати. Свидетельство о регистрации № 018929 от 10.06.99.

Дизайнер Т.Н. Погорелова. Технический редактор И.С. Павлова. Корректор М. Г. Джавадян

Сдано в набор 30.01.2004. Подписано в печать 10.03.2004. Формат 60×88 1/8. Бумага офсетная. Печать офсетная.

Усл. печ. л. 5,88. Усл. кр.-отт. 7,84. Уч.-изд. л. 7,24. Заказ 480. Цена договорная

Отпечатано в Подольской типографии ГУП ЧПК, 142110, г. Подольск, ул. Кирова, 25