

Glukhova O. E., Slepchenkov M. M. *Theoretical Investigation of the Local Stresses Distribution of the Graphene* 2

A new method of calculation of the local stresses field based on the quantum model of the graphene finite-dimensional nanoribbon and the empirical method in the energy calculation of one atom are proposed. The field of the local stresses of the graphene nanoribbons compressed by 6 % is calculated. It is established that the distribution of the maximum value of stresses coincides with the distribution of the maximum pyramidalization angle of the atomic skeleton.

Keywords: nanoribbons, local stress, angle of pyramidalization, volume density of energy

Mikhailov V. P., Stepanov G. V., Basinenkov A. M., Sobov I. K., Shakov K. G. *Control of Active Vibration Isolation and Positioning of Magnetorheological Devices* 5

Physical model of magnetorheological (MR) elastomer — working environment for vibration isolation and positioning devices of nanotechnology equipment is given. The design of new active damper on the basis of MR-elastomer is described. The dynamic model and results of studies of active damper on the basis of MR-elastomer are presented.

Keywords: vibration isolation and positioning systems, magnetorheological elastomers, viscosity, elasticity

Syakina S. D., Nikitina L. V., Simakov V. V., Sinev I. V., Chichvarina O. G. *Stability of the Electrical Properties of the Wide-Gap Gas-Sensitive Nanostructures Materials* 10

The influence of sorption on the resistance of thin films of metal oxides are widely applied in gas sensors. The adsorption of the gas-oxidizer particles on the surface of wide-gap semiconductors (for instance, tin dioxide) leads to the capture of charge carriers from the grains volume and causes change of the electrophysical properties of material. The value of conductivity of the film in the gas sample is usually used as registrable parameter of gas-sensitive layers. The paper proposes using of SnO₂ polycrystalline layers with cylindrical grains (nanorods) to detect gases of different nature due to the greater thermal stability of their electrical properties in comparison with the layers consisting of grains with spherical shape. This feature of nanorods is conditioned by the weak dependence of individual grains conductivity on the geometry of intergranular isthmuses which are formed at the elevated temperatures as a result of individual grains bonding.

Keywords: nanocrystalline materials, filamentary structures, wide-band semiconductors, gas-sensitivity, thermal stability

Shomakhov Z. V., Molokanov O. A., Karmokov A. M. *Lead-Silicate Glass Conductivity at Heating and Isothermic Annealing* 14

The Experimental explored kinetics to conduction in leaden-silicate glass C87-2 at isothermal and polythermal annealing. The Experiments have shown that conduction depends on values missed electric charge and from the temperature annealing. The maked estimations of time of the determination of the balance in structure flow depending on the temperature annealing.

Keywords: isothermal annealing, an electrical conductivity kinetics, lead-silicate glass, structural transmutations, a specific conductivity, phaseformation, conductivity activation energy

Dzhashitov V. E., Pankratov V. M. *The Superminiature Micromechanical Sensor of the Inertial Information in Conditions of Thermal Effects* 18

Mathematical models of thermal processes superminiature (a volume < 0,2 mm³) the micromechanical sensor of the inertial information are constructed and researched. Supporting algorithms and the software allowing to calculate, to analyze and to visualize inhomogeneous non-stationary three-dimensional temperature fields of the sensor are developed. The qualitative and quantitative analysis of influence of exterior and interior non-stationary temperature actions on temperature fields of a sensor is lead, the possibility of control by these fields is shown. Obtained data will allow to create the superminiature micromechanical gyro with the set properties and invariant to thermal effects.

Keywords: superminiature the micromechanical sensor of the inertial information, thermal effects and processes, mathematical models

Lukyanov D. P., Shevchenko S. Yu., Kukaev A. S., Safronov D. V. *Analysis of Surface Acoustic Wave-Based Solid-State Gyroscopes Design Concepts* 24
Design concepts of surface acoustic wave (SAW)-based solid-state gyroscopes (SSG) are being observed. Schematic configuration, experimental results and achieved characteristics are being analytically compared. Sensors readiness time is being estimated and development trends of shock robust and vibration resistant SAW-based SSGs are being discussed.

Keywords: MEMS, surface acoustic wave, delay line, solid-state gyroscope, inertial mass

Godovitsyn I. V., Amelichev V. V., Saurov A. N., Gavrilov R. O., Generalov S. S. *Miniature Tenzoresistive Pressure Sensors: 25 Years of Evolution* 29
This paper gives a review of state-of-the-art of miniature (surface micromachined) tenzoresistive pressure sensors from 1985 to present day. The key difference of miniature pressure sensors from traditional ones — deposited membrane instead of etched membrane — and resulting design and technology features are emphasized and discussed. Advantages and disadvantages of miniature pressure sensors are discussed. A number of examples of miniature pressure sensors based devices is presented. Increase of sensitivity as a condition for making miniature pressure sensors an attractive choice for integrated devices is proposed.

Keywords: miniature pressure sensors, surface micromachining technology

Voitsekhovskii A. V., Nesmelov S. N., Kulchitsky N. A., Melnikov A. A. *MEMS-Detectors for Infrared Spectral Range* 42
The features of the technology of MEMS-based uncooled thermal infrared detectors, and the parameters of single detectors and array of detectors of this type were considered. Much attention is paid to a new type of thermal detectors — microcantilevers with electrical and optical readout.

Keywords: MEMS, microbolometer, microcantilever, detectors infrared

For foreign subscribers:

Journal of "NANO and MICROSYSTEM TECHNIQUE" (Nano- i mikrosistemnaya tekhnika, ISSN 1813-8586)

*The journal bought since november 1999.
Editor-in-Chief Ph. D. Petr P. Maltsev
ISSN 1813-8586.*

**Address is: 4, Stromynsky Lane, Moscow, 107076, Russia. Tel./Fax: +7(499) 269-5510.
E-mail: nmst@novtex.ru; <http://www.microsystems.ru>**

Адрес редакции журнала: 107076, Москва, Стромьинский пер., 4. Телефон редакции журнала (499) 269-5510. E-mail: nmst@novtex.ru
Журнал зарегистрирован в Федеральной службе по надзору за соблюдением законодательства
в сфере массовых коммуникаций и охране культурного наследия.
Свидетельство о регистрации ПИ № 77-18289 от 06.09.04.

Дизайнер Т. Н. Погорелова. Технический редактор Е. М. Патрушева. Корректор

Сдано в набор 16.05.2011. Подписано в печать 22.06.2011. Формат 60×88 1/8. Бумага офсетная. Печать офсетная.
Усл. печ. л. 6,86. Уч.-изд. л. 8,41. Заказ 467. Цена договорная

Отпечатано в ООО "Подольская Периодика", 142110, Московская обл., г. Подольск, ул. Кирова, 15