

CONTENTS

Alfimov S. M., Bykov V. A., Grebennikov E. P., Zheludeva S. I., Maltsev P. P., Petrunin V. F., Chapligin Yu. A.
The Development Nanotechnologies in Russia 2

The development nanotechnologies of the new directions technologies in Russia.

Samoilovich M. I., Kleshcheva S. M., Belyanin A. F., Jitkovsky V. D., Tsvetkov M. Yu. *3D-Nanocomposites Based on Ordered Packings of Silica Nanospheres* 9

The fabrication technology for ordered packings from monodisperse silica nanospheres has been developed. This allowed new types of materials to be created: 3D superlattices, including the so-called photonic crystals or photonic band-gap materials.

Experiments to fill an interglobular space with semiconductors, superconductors, optically amplified, ferromagnetic and other materials have been carried out via specially devised techniques. Unique three-dimensional nanosystems thus created were found to exhibit quantum-size and other nanoscale effects such as, for example, nonlinear interaction between individual nanocluster electron subsystems.

Serov I. N., Iosht M. A., Koshcheyev S. V., Margolin V. I., Moshnikov V. A., Chesnokova D. B. *The Analysis of the Structural Characteristics of Nano-Crystalline Layers of PbSe* 17

Is carry ouied the comparative analysis of the structural characteristics of nano-crystalline it is layer PbSe, obtained by the method of thermal vacuum deposition with the participation and without the participation of fraktal-matrix strukturizators of "Aires". It is shown that the application of strukturizator leads to the minimization of the surface energy of the nano-crystalline sructure of PbSe, preferred orientation on the planes of cohesion (100). It is established that with the use of strukturizator the distribution of crystallines in the layer bears fraktal nature.

Lomayeva S. F., Lomayev I. L. *Application of AFM and XPS in Measuring Thickness of Surface Coating for Nanostructured Materials* 20

A technique to measure the thickness of surface films (d) on top of nanostructured materials, using X-ray photoelectron spectroscopy and atomic force microscopy was suggested in the paper.

Shalobaev E. V., Monahov Yu. S., Starzhinsky V. E., Shiljko S. A. *Manufacure Technologies of Cog-Wheels and Drives for Microelectromechanical Systems* 24

In article the basic group technological methods for manufacturing elements of the microelectromechanical systems representing volumetric tree-dimensional structures are considered. Stages of microprocessing are stated.

Berikashvili V. Sh., Grigorjantz V. V., Klyuchnik N. T., Kochmarev L. Yu., Shilov I. P., Jakovlev M. Ja. *Microwave Plasmochemical Deposition on the Planar Waveguide Strutures on the Base of Silica Glass* 28

Peculiarities of the planar optical waveguide formation of the base of silica glass in the waveguide microwave plasmotron on the H₁₀-mode are studied. The offered device of the microwave discharge excitation is the effective means for optical structure formation of the SiO₂-F|SiO₂|SiO₂-F composition. On the base of designed optical waveguides the couplers with 16 × 16 delivering matrix have been produced. These couplers are intended for power distriution in the communication optical fiber systems.

Zvetkov Yu. B. *Layers Registration Analysis in MEMS Production* 33

Registration model for photolithography used in MEMS fabrication is devised and demonstrated. One can use this model for decomposition of overlay errors and for limiting factors determination. Spatial distributions of overlay errors can be divided into two categories: intrafield and interfield systematic sources. Al these can be described by regression polynomials with linear and nonlinear terms. Some possible ways of using the model for analysis of back-to-front photolithography are considered.

Mihaylov P. G. *High-Temperature Sensor Elements and Structures Development Investigations* 38

High-temperature microelectronic sensor development investigations are analyzed. Designs and processes which enable the sensor working temperature range increase are introduced.

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