

- Kukovitsky E. F., L'vov S. G.** *Carbon Nanotube Field-Emission Cathodes on Nickel Bases* . . . . . 2  
 Inexpensive laboratory technology to obtain carbon nanotube field emitters on moderate nickel bases has been developed. Unconventional CVD method was used for carbon nanotube growing. Fundamental processes taking place in the CVD reactor during carbon nanotube layer formation on the surface of bulk catalytically active metals were considered. The possibility of nonuniform catalytic carbon deposition on the surface of nickel base was shown experimentally and theoretically. The suitable procedure to produce uniform carbon nanotube layers with identical field emission characteristics was found and realized.  
**Keywords:** carbon nanotubes, field emitters, nickel bases, CVD-method, heterogeneous reactions, homogeneous reactions
- Utenkova S. B., Maltsev P. P.** *About Mechanical Strength of Arrays of Carbon Nanotubes* . . . . . 6  
 In this review the mechanical properties of arrays of carbon nanotubes are presented. At present day carbon nanotubes are popular material and they find a wide use in Electronics. With the help of carbon nanotubes we can make a carcass of Nanoscale bonding saving a precise geometry of a contact. The perspectives of practicable applications of arrays of carbon nanotubes for the formation of mechanical bond of interfaces of high strength are considered here. The most essential experiments with carbon nanotubes are described and in which basic properties are defined.  
**Keywords:** arrays of carbon nanotubes, mechanical adhesiveness of surfaces, multilevel assembly of chips
- Voitsekhovskii A. V., Kokhanenko A. P., Korotaev A. G., Grigor'ev D. V., Kulchitsky N. A., Melnikov A. A.** *Radiation Effects in MST* . . . . . 10  
 Radiation effects in MST are observed. Both bulk and epitaxial material are viewed. Electron,  $\gamma$ -ray and ion irradiation are in consideration. Similar features and differences are considered for different particle type. Radiation effect explanations are presented.  
**Keywords:** mercury cadmium telluride, radiation defects, photonic detector, ion implantation
- Varenik Yu. A., Pecherskaya R. M.** *Test-Signal Generating for C-V Measurements* . . . . . 17  
 The article is about some problems of test-signal generating in C-V measurements of semiconductor structures. The unusual test-signal generating scheme based on principles of generators and load bridge connection was offered by authors. In this article was described the developed measuring equipment based on offered generators and load bridge connection. This article can be useful for C-V measurement systems developers and semiconductor nano- and microstructures investigators.  
**Keywords:** C-V measurements, C-V characteristics, MOS structures, semiconductor structures, test signal, impedance, network analyzer
- Tarnavsky G. A.** *Doping in Nanocolumns of Surface Relief of Silicon Wafer* . . . . . 20  
 The investigation of technological process of implantation of doping impurities of acceptor and donor types (boron, phosphorus and arsenic) in silicon wafer with complicated surface nanorelief was conducted by computer simulation.  
**Keywords:** computer simulation, doping in silicon, implantation, donor and acceptor impurities, relief nanocolumns
- Kloss Yu. Yu., Rogozin O. A., Tcheremissine F. G.** *Computer Simulation of the Multistage Knudsen Micropump in Plane Geometry* . . . . . 24  
 The multistage Knudsen micropump that is based on thermal creep phenomenon and do not have moving parts is studied by means of computer simulation. Parametric analysis of the pump performances is carried out. Solution of the Boltzmann kinetic equation is made with the application of the conservative projection method for the evaluation of the collision integral.  
**Keywords:** Knudsen pump, microdevices, thermal creep, Boltzmann equation, computer simulation

**Tikhonov R. D.** *Lateral and Planar Bipolar Magnetotransistors* . . . . . 31

With the help of modern device-technological modeling the distributions of carriers of a charge, density of currents and recombination speed in two-collector lateral bipolar the magnetotransistor generated in a well at external connection of contacts to a substrate and to a well are investigated. The experimental research dual-collector lateral bipolar magnetotransistor with base in well, as sensor of weak magnetic fields is spent. The absolute sensitivity 900 V/T, voltage of noise in a working mode and resolution  $5 \cdot 10^{-10}$  T is determined.

Mechanisms of formation of sensitivity dual-collector lateral and planar bipolar magnetotransistors on the basis of change in a magnetic field of current lines of the injected charge carriers are considered. The analysis of distribution of a current in structures of devices gives the list of mechanisms of sensitivity and the recommendation about its increase at the expense of a choice of structure bipolar magnetotransistor.

**Keywords:** bipolar magnetotransistor, current lines, galvanomagnetic effect

**Dragunov V. P., Ostertak D. I.** *An Electrostatic Microelectromechanical Converter with a Series Circuit* . . 37

The results of theoretical and experimental study of single-capacitor microelectromechanical mechanical-to-electrical energy converter with a series circuit are presented. The analysis of the converter operation is carried out, and analytical expressions for evaluation of the converter parameters are derived. The dependences of the load voltage against time and frequency of the capacitance modulation are calculated and also measured. It was established that the dependence of the output power versus modulation frequency and load resistance has a maximum.

**Keywords:** ambient energy harvesting, variable capacitor, micropower generator, microelectromechanical converter, capacitance modulation, mechanical-to-electrical conversion, electrostatic energy converter

**Rzjanina A. V., Usanov A. D., Skripal An. V., Usanov D. A.** *The Influence of Carbon Nanotubes with Mammalian Cells by Centrifugation* . . . . . 43

The influence of carbon nanotubes with mammalian cells MA-104 и A549 by centrifugation has been investigated. The influence of nanotubes on mammalian cells by centrifugation with preliminary treatment by magnetic field of cells has been analyzed.

**Keywords:** carbon nanotubes, mammalian cells, magnetic field

**Agafonov V. M., Krishtop V. G., Safonov M. V.** *Measuring Means Based on Molecular-Electron Transfer in Micro- and Nanostructures* . . . . . 47

The major advantage of sensors, designed on the basis of molecular-electronic technology, is extremely high slope transform the mechanical signal into an electrical current. The basis of this class of devices based on the principle of diffusion of charge transport in conditions of forced convection, which arises under the action of an external acceleration. We demonstrate the possibility of designing a modern high-microaccelerometer based on molecular electron transfer (MET — molecular-electron transfer) in nanostructures.

**Keywords:** molecular-electronic technology, molecular-electron transfer, conversion of mechanical signals, convective diffusion, transfer function, microaccelerometers, nanostructures, microelectronic processing

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