

Shevtsov S. N., Akopyan, V. A., Panich A. A., Parinov I. A., Samochenko I. G. *Optimization of Piezoelectric Vibration Damping for Composite Helicopter Rotor Blade* 2

For composite beam that model a spar of helicopter rotor blade the comparative investigation of flexural vibration damping with unimorph and bimorph piezoelectric patches has been presented. The optimal constraints for location on the host structure and sizes of PZT actuators have been determined in order to suppress specific mode of flexural vibration. Finally, we derive the necessary conditions for effective vibration damping of host structure by shunted passive PZT transducers.

Keywords: helicopter rotor blade, vibration suppression, piezoelectric transducer, stability of control, vibration modes

Kulchitsky N. A., Melnikov A. A. *Current State of the Production CdTe, ZnTe, $Cd_{1-x}Zn_xTe$ and Devices from these Materials* 9

In the review it is considered world production CdTe, ZnTe and CdZnTe, received rapid development during the last years. The current state is considered, the analysis of development of the markets tendencies, the review of manufacturers of considered compounds, and also a condition of the Russian market is given.

Keywords: cadmium telluride, solid solution zinc — cadmium telluride, production of crystals, detectors, demand, the offer

Hromova L. P., Korostelev V. F. *Formation of Quasicrystal Structures in the Conditions of Pressure Imposing* 17

Results of metal-graphic and X-ray-fraction researches of the experimental models, received by molding with imposing of pressure prior to the beginning of crystallization are resented. It is established, that pressure can be used for formation of quasicrystal structures with higher elastic properties.

Keywords: icosahedral symmetry, the thermodynamic stability, long-range order, a base element, the imposition of pressure, excess phase, increasing the elastic properties

Pecherskaya Ye. A., Metalnikov A. M., Boboshko A. V. *Structure of Intelligent System to Support of Ferroelectric's Parameters Research* 21

The generalized structure of intellectual system to support nanotechnology research materials on the example of ferroelectrics is presented. The content of multi-purpose bank of knowledge, which is intended for data processing and decision making in the research process considered.

Keywords: ferroelectric, model, intelligent system, method of measurement, accuracy, decision-making

Kozlov G. V., Aphashagova Z. Kh., Malamatov A. Kh. *The Crystallization Process Efficiency of Nanocomposites Polyethylene/Calcium Carbonate* 25

It has been shown, that crystallinity degree increasing for nanocomposites polyethylene/calcium carbonate is due to polymer matrix chains statistical flexibility enhancement. The last effect is the result of nanocomposite structure change at nanofiller introduction.

Keywords: nanocomposite, polyethylene, calcium carbonate, crystallization, polymer chain flexibility

Aravin V. V., Verner V. D., Saurov A. N., Maltsev P. P. *MEMS of High Level is Possible Way of the Development of MEMS in Russia* 28

On the basis of the analysis of tendencies of the development of MEMS the use of MEMS conception of high level as fundamental direction of elaborations and production of MEMS in Russia is suggested.

Keywords: MEMS, production, integral scheme

Belozubov E. M., Belozubova N. E. *Increasing to Time Stability of Sensors of Pressure on the Basis of Thin-Film Nano- and Microelectromechanical Systems* 31

The time stability of sensors of pressure on the basis of thin-film nano- and microelectromechanical systems (NaMEMS) is considered, conditions and criterions of the time stability are worked out. Structured-factorial method of increasing to time stability of NaMEMS is offered. Adequacy of the offered conditions and criterions of the time stability of NaMEMS are confirmed experimentally.

Keywords: thin-film nano- and microelectromechanical systems (NaMEMS), time stability, temperature, deformation, criterion

Dzhashitov V. E., Pankratov V. M. *The Superminiature Micromechanical Sensor of the Inertial Information in Conditions of Variables and Constant Mechanical Effects* 39
Mathematical models are constructed, the supporting software is developed and influence of constant and vibration, translational and angular accelerations on functioning superminiature (a volume $<0,2 \text{ mm}^3$) the micromechanical sensor of the inertial information is studied. Qualitative and quantitative estimations of such influence on output characteristics of the sensor are received. The most adverse mechanical effects and their combinations are revealed. Obtained data will allow to create the superminiature micromechanical gyro with the set properties.

Keywords: superminiature micromechanical the sensor of the inertial information, equations of motion, variables vibration and constant mechanical effects, mathematical models

Adamov Yu. F., Gorshkova N. M., Sibagatullin A. G., Somov O. A. *Adaptive Parameter Correction of Functional Units for SOC* 44

Adaptive parameter correction techniques of the functional units allows to reduce their output parameters dependence from technology transistors mismatch, to eliminate electron injection into the substrate and to decrease crosstalks in interconnections.

Keywords: adaptive parameter correction, technology mismatch, electron injection into the substrate, crosstalks

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