CONTENTS

Shalobaev E. V., Starzhinsky V. E., Shiljko S. A.	
Manufacture Technologies of Cog-Wheels and Drives	
for Microelectromechanical Systems. Cogged	
Micromechanisms of MEMS: The Experiment of the Production	
and the Statement of the Problem on the Perspective	. 2

The analysis of the foreign and native developments in the area of the mechanical components of microelectromechanical systems is produced; the problems are disclosed and the ways of their solution are planed.

Balysheva O. L., Smirnov Yu. G., Konovalova L. P. The Development of a Reference System on SAW Components 6

The work's results on the development of a reference system (database) on SAW components are presented. The project on the system development is approved and financially supported by the Russian Foundation for Basic Research. The database contains information on literature, SAW material parameters, mathematical models, SAW filter characteristics, and organizations and firms (worldwide) specialized on SAW devices.

Valiev K. A., Kalnov V. A., Kiryanov A. P., Maltsev P. P. The Simulation of Mobile Diffraction Gratings for Microsystems Technique

The versions of simulation of mobile diffraction gratings used as a countermeasure feeler of the micromechanical accelerometer surveyed. The results of simulation display the expressed relation of parameters of a diffraction pattern (intensity of a principal diffraction peak for the chosen angles of diffraction) from value of a gap between mobile and fixed lattices.

The analysis of signal degradations is adduced at reproduction thermomagnetic record of the information at the destabilizing factors. The methods formation digital signal from reproducing signal with allowance of noise in a play are investigated. Is drawn a conclusion about the best suitability for extreme detecting pulse methods of a record, founded on the obtained property signal.

Using the program package of device-and-process simulation ISE TCAD we investigated lateral dual-collector bipolar transistor functioning when formed in diffusion well. The dependency of relative current sensitivity and distribution charge curriers was investigated at low and high injection level. It is established, that the negative relative current sensitivity appears in BMT as a result of the involved in recombination electron and hole flows redistribution induced by magnetic field, i. e., as the result of concentration-recombination mechanism of magnetosensitivity.

The materials of the report in the condition and the development of nanotechnology and nanomaterials creation discussed in the meeting of the Ministry of the industry, science and technologies of Russia Federation are stated.

Levichev V. V., Maksimov G. A., Mishkin V. P., Filatov D. O. Correlation Between the Topography of Emitting Mirface of a Semiconductor Laser Diode and Structure of its Radiation in Near Field

The correlation between the structure of the InGaAs/GaAs semiconductor laser diodes (LDs) with InGaAs quantum wells (QWs)
and the spatial structure of the LD radiation was investigated by
Scanning Near-fieldoptical Microscopy (SNoM) and cross-sectional
Atomic Force Microscopy (AFM). To reveal the LD structure selective chemical etching (enchant with higher etching rate for GaAs and
lower one for InGaP and InGaAs) was applied. It was shown to be
possible to associate the spatial structure of LD radiation with the
structure of the active layer by means of comparing the data obtained
by both methods, in particular, to find out the position of the QWs
in the waveguide relative to the emitting mode profile.

The results of theoretical studies the crossovers of atomic lens for atomic beams and the possibility of their use as the sources of illumination for the corpuscular in-line holography are represented. It is shown that resolution in the reconstructed image is of the order of crossover diameter in the focus of atomic lens, whose value comprises fractions of angstrom. The conjugated image does not affect strongly the reconstructed image.

The possibility of measurements of nanovibration and microdisplacement are described with the use of semiconductor laser as a measurement system operating in autodyne detection regime. The method of vibration and displacement diagnostics of components of biological specimens has been developed by using of autodyne laser system. As a example the results of micromovement measurements of eye and hart of freshwater crayfish — Daphnia have been presents.

Kulchin Yu. N., Denisov I. V., Kirichenko O. V., Denisova E. V., Sedov V. A., Drozdov R. S. Breadboard Model of the Optoelectronic Measuring Neural-Like System 40

In this work the breadboard model of the optoelectronic measuring neural-like system is described. This breadboard model is the base element for creation of a new class adaptive optoelectronic control and measuring devices. The system allows restoring spatial structure of distributions of physical fields, to carry out diagnostics and protection of technical and technological objects.

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