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Perspectives terminology of MEMS/MST and NEMS/NST developed.

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Terminology in field of Microsystems Technology (Technique) subject to existing definicions as techniques, connected with miniaturization of elements size micrometers diapason is presented.

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Perspectives of Science use, which is the most rapid developed global scientific-technical direction are considered.

Optical investigations of 17-period In<sub>0.45</sub>Ga<sub>0.55</sub>As/GaAs structures with quantum wires (QWRs) have been performed after rapid thermal annealing (RTA) at the temperatures 550 to 850 °C for 30 s. It has been shown that RTA results in the high-energy shift of photoluminescence (PL) band peaks inherent to (In, Ga)As QWs and 2D (In, Ga)As layer, which is caused by changes of their component composition and strain values as a consequence of In/Ga atomic interdiffusion processes. The change of the activation energy describing the thermal decay of (In, Ga)As QW PL band in the annealed samples in the dependency on the annealing temperature have been explained by the change of the quantum-dimensional potential in the result of interdiffusion. The high-energy shift of (In, Ga)As QWRs PL peak with increasing the excitation intensity is indicative of the presence of piezoelectric field within QWRs. We found a strong optical anisotropy of PL spectra, which is a result of OWRs shape anisotropy as well as anisotropy of strain relaxation. It has been shown that RTA of (In, Ga)As multilayer structures with QWRs can be used to improve size homogeneity of QWs, increase the degree of linear polarization and change the emission energy.

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The possibility of reconstructing the inner structure of one-dimentional phase objects under the conditions of X-ray spherical-wave diffraction focusing is discussed. Strong-absorbing wadge-like crystal with rib parallel to diffraction vector in symmetrical Laue geometry is used as a monocrystal-analyzer. Displacing the phase object along the direction of diffraction vector with smaller steps than the

sizes of the focus are one can bring different parts of phase object into the focusing conditions. Registrating the whole data map one can reconstruct wave phase shift obtained in phase object.

Dependence of tip displacements on STM axis inclination is under investigation. This dependence is caused by elasticity of STM structure. Experiments show that results of calculations explain correctly observed dependence.

The technical approaches with the use of thermomigration processing in MEMS technology are presented. The specific examples of using the process as applied to silicon micromachining, p-n junction isolation, electrical commutation and monolithical assembling of silicon parts are described.

At this paper investigation results of emission properties carbon nanotubes cathodes are represented. These cathodes were produced by low temperature chemical vapor deposition method (temperature 500  $^{\circ}\text{C}$ ) from ethanol vapor, that allowed to use a glass as a cathode substrate. Investigated samples differ by geometry of deposited layer of the carbon nanotubes: with complete cover and cover with islands of different diameters.

The results of the status and evolution of miniature control multilink robot motion inside of small diameter tubes are presented. The most perspective schemes technical solutions and control motion realizations are considered for miniature inside tube robots, developed on the base of computer simulation and physical modeling.

The advanced tendencies in R & D and miniature robot applications are important for problem solving in the area of automation technology.

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