

Okrepilov V. V. *Quality in Nanotechnology: Role of Metrology and Standardization* 2

The basic supporting pillars of quality are metrology and standardization. They cover all spheres of the economy including nanotechnology. Metrology enables to measure parameters and characteristics of processes and objects of nanoindustry with accuracy needed in the practice and ensures tracing physical units up to the national standard for each kind of measurement. Standardization allows using the standard terms and definitions. The standards also lay down the optimum requirements to objects of nanoindustry and methods for their testing. The article will focus on problems and their solution in the fields of standardization, conformity assessment, information and technical backing of nanotechnologies and nanoproducts.

Keywords: nanoindustry, nanotechnology, nanoproducts, metrology, measurement, measuring needs, traceability, verification, calibration, standardization, conformity conformation.

Volobuev A. N., Skvortsov A. V. *Interaction of Photons High Energy with Poolry Connected Electrons on Nano- and Microlevels*. 7

Various variants of interaction of photons high energy with free electrons in substance are investigated. It is shown, that among these variants, in substance can be observed: absorption of a photon by electron, coherent and not coherent dispersion of photons, a stop electron after interaction with a photon. Dependence of change of length of a wave of a photon after interaction with electron from parameters of substance and speed of movement electron is found.

Keywords: photons high energy, coherent and not coherent dispersion.

Abramov I. I. *Problems and Principles of Physics and Simulation of Micro- and Nanoelectronics Devices. VI. Quantum Wire Structures*. 14

The models of quantum wires and devices based on quantum wires were analyzed. The perspectives of quantum wire structures were considered.

Keywords: quantum wires, quantum interference, devices.

Ponomarev A. N., Yudovitch M. E., Gruzdev M. V., Yudovitch V. M. *Interaction of the Electric Field with Non-metallic Nanoparticles. Part 1. The Theoretical Estimation of Topological Factor* 29

On a base of Maxwell's electromagnetic theory the interaction of electromagnetic and electrostatic fields with nonmetallic nanoparticles have studied. It was founded that the nanoparticle shape is the dominant item are influencing on the interaction. The existence of giant resonance (increasing of the field strength) on the surface of toroid-like particles have founded.

Keywords: nanoparticles, electromagnetic fields, Maxwell theory.

Neveshkin A. A., Revzin B. A., Gorin D. A., Yaschenok A. M., Klimov B. N., Kumakov A. V., Kumakov Yu. A.
An Automated Setup Based on Characteriograph "Erbium-7107" for Investigation Electro-Physical Properties of MIS-Structures with Nanodimensional Langmuir—Blodgett films 34

An automated setup for investigation electro-physical properties of MIS-structures with nanodimensional Langmuir—Blodgett films is described. The design, the scheme of connection with a computer, and software of the setup are described. The design and functional resources of measurement cell is described in detail. The results of volt-ampere characteristic measuring of MIS-structures with organic nanodimensional Langmuir—Blodgett films based on calixresorcinarene with nickel ions is presented.

Keywords: MIS-structure, electro-physical properties, nanodimensional organic film, Langmuir—Blodgett films, automated measurement setup.

Obukhov I. A. *Features of Functioning of Quantum Devices* 38

Demonstrated that quantum devices functioning by using of nonequilibrium boundary effects may to reach characteristics comparable with characteristics of traditional devices of microelectronics.

Keywords: nanoelectronics, mesoscopic structures, quantum devices, nonequilibrium effects, boundary effects, quantum wire.

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