based on chaotic transceiver. Printed monopole antenna with a transmitter in the form of a disk, and an F-inverted antenna were selected as samples for the research. The area of ground electrode of the antennas to be used for placing the transceiver circuit. It can significantly reduce the overall size of the device, but requires careful design, taking into account the electromagnetic compatibility. Both a numerical electromagnetic analysis of selected types of antennas and experimental verification of the optimal configuration were accomplished during research and presented in the paper.

Cluster finding in silicon detectors

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The simple method of cluster finding and vertex reconstruction in silicon detectors are discussed.

Self-organization of polymetallic coordination LB-complexes of nanocyclic pyrrole-thiophene ligands

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Metal-polymers with rare earth and transition elements are of great interest as a quantum spin-polarized conducting molecular layers formed in the process of self-assembly. Method of formation of a self-organizing monomolecular layer (monolayer) on the surface of a liquid subphase is the method of Langmuir - Blodgett (LB). Self-organized metal-polymeric LB-film from oligomer of pyrrole-thiophene series have been obtained. Incorporation of iron ions in the pyrrole-thiophene LB-monolayers in the presence of salts of rare earth elements has been studied by thermodynamic, electro-physical and optical methods with structural and fluorescence analysis to determine the states with intermediate valence of such organopolymetallic complexes. Distinctive characteristics of crystalline iron containing pyrrole-thiophene LB-monolayers fabricated on the surface of an aqueous solution of iron salts and hydrochloric acid are a magnetic ordering and an exciton excitation of metal atoms in nanocavities of organic environment. These properties are due to the paramagnetism of iron complexes of aromatic macrocyclic ligands from which in self-assembly process, provided the deformation of the electron density, the planar polynuclear metal-complexes of macrocyclic ligands -- Fe-containing monolayers of pyrrole-thiophene oligomer are formed. Nonlinear optical properties of such LB-films are due to the transfer of energy released at localization of π–electron states of organic ligand environment to electron-hole pair (exciton). Such a metal-polymer exists

provided that a resonance energy transfer to the quasiparticle excitation on a metal subsystem takes place with excitation of the mixed state of localized d(f)-orbitals of valence electrons and delocalized s(p)-electron orbitals of conduction band, or more accurately not a mixed but a generalized coherent electron state. It is shown that the electron transfer to the conduction band changes the electron configuration $d(f)^n$ on $d(f)^{n-1} + e$ and leads to increasing of the valence of the metal by unit. Therefore, these coordinating systems are systems with mixed valence. The long lifetime of the spin-polarized electron states of metal atoms in the obtained complexes leads to the Hanle effect, which is proposed to use in development of spintronic devices.

Light propagation in turbid media by phase-sensitive and phase-insensitive numerical methods: application to biological tissues

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Light propagation in turbid media is specifically relevant in the field of biomedical optics, as biological tissues are strongly turbid media. Diagnostic or treatment applications require information regarding the spatial distribution of optical energy. This is crucial for planning the therapeutic effect or the quality of the diagnostic images obtained. In this work we compare two numerical approaches for light propagation in biological tissues. The Monte Carlo approach provides a phase-insensitive method for light propagation. On the other hand, we implement a phase-sensitive approach based on Maxwell equations. The results of both approaches are discussed.