



Investigation of the mechanisms of plasmon oscillations in the "layered material-dielectric substrate" structures used as structural components of nanoscale antennas

Key research objectives:

- Perform modeling of the band structure, density of the electronic states of layered nanostructures, dielectric and magnetic permeability depending on the composition of the nanostructures;
- Reveal the regularities of the influence of the composition of the nanostructure on the features of the band structure and the density of states;
- Calculate the dynamic conductivity of the nanostructures under study;
- Reveal the mechanisms of absorption, radiation, and amplification of plasmon oscillations in the studied nanostructures;
- Perform a simulation of the absorption and transmission coefficients of terahertz radiation;
- Determine the regularities of reducing the wavelength of plasmon oscillations.

Relevance of the research:

The stability of two-dimensional configurations makes heterostructures based on a metal layer and a dielectric substrate promising as materials for nanoplasmonics devices with an operating frequency in the terahertz range.

Reducing the geometric dimensions of the antennas while maintaining the required operating frequency range is an important problem, the solution of which will allow us to master new nanoelectronics technologies.

Type of collaboration

research cooperation

Key words

plasmon, substrate, nanostructures, nanoelectronics

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