

Electromagnetic waves in non-limited and limited superlattices by the presence of impurity layer

S.N. Kurilkina and M.V. Shuba

Department of Optics, Gomel State University
Sovetskaya ul. 104, 246019 Gomel, Belarus
Fax: + 375-232-576557
E-mail: Shuba@gsu.unibel.by, kurilkina@gsu.unibel.by

It has been investigated the peculiarities of propagation of electromagnetic waves in superlattices (SL) formed by anisotropic layers by the presence of impurity. It has been obtained and analyzed dispersion equation. It has been established the dependence of zone structure of volume electromagnetic waves spectrum on polarization of incident light, anisotropy of SL components and impurity. It has been shown that spectrum of light radiation qualitatively changes by disorientation of crystallographic axes of layers. It has been found expression for impurity modes. It has been established dependence of orientation of their maxima on polarization state of incident light. It has been shown that use of impurity modes as lasing modes permits to enhance the lasing gain. It has been established the dependence of generation regimes of given lasing systems on change of polarization state of incident electromagnetic radiation.

Superresolution at reconstruction of a permittivity profile of an optical waveguide from its far-field radiation pattern

L.I. Sotskaya and A.B. Sotsky

Institute of Applied Optics, National Academy of Sciences of Belarus
B-Biruli ul. 11, 212793 Mogilev, Belarus
Tel./Fax +375-222-264649
E-mail: ipo@physics.belpak.mogilev.by

Reconstruction of permittivity profiles $\varepsilon(\mathbf{r})$ of inhomogeneous optical waveguides is one of the basic problems of the integrated optics. The most universal way to its solution consists in searching for the lateral