MANIFESTATION OF SPATIAL ORDERING OF QUANTUM DOTS IN MULTILAYERED SiGe NANOSTRUCTURES IN X-RAY DIFFRACTION PATTERNS

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S u m m a r y

By analyzing the intensity distribution of diffusely scattered X-rays in the reciprocal space, information concerning a transformation of two-dimensional structures in multilayered SiGe specimens into three-dimensional ones has been obtained. Weakly correlated quantum dots which contribute to the formation of lateral satellites have been shown to affect insignificantly the formation of a coherent satellite structure. Nevertheless, their influence on the distribution of deformation fields in superlattice layers remains substantial. It has been illustrated by applying the method of two-dimensional reciprocal space mapping of the X-ray intensity distribution to periodic Si/SiGe superlattices with different thicknesses of Ge layers (4 and 7 monolayers) and to periodically distributed SiGe dots buried in silicon.