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Designing of GaAs/AlGaAs multiple quantum wells to enhance magneto-optical Kerr effect

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Keywords

magneto-optical Kerr effect (MOKE), GaAs/AlGaAs MQWs, interference

Abstract

In this article we study magneto-optical Kerr effect (MOKE) of the GaAs/Al_{0.31}Ga_{0.69}As multiple quantum wells (MQWs). Firstly, comparing the measured spectra of MOKE with the theoretical ones we established parameters of the sample such as energy of excitons in quantum wells, their oscillation strengths, damping coefficients. Then using the obtained parameters we tried to establish which quantum well from the 30 quantum wells existing in the sample is the most responsible for the value of rotation of polarization plane of light in measured MOKE. Finally we analysed how the geometry of the structure influences the value of the rotation. We changed the widths of all barriers between the wells of MQWs while the other parameters remained unchanged. It occurred that the rotation of polarization plane changed periodically. A big enhancement of MOKE can be obtained for certain widths of barriers. It confirms that the interference plays a crucial role in the MOKE.



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