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New method and treatment technique applied to interband transition in GaAs1-xPx ternary alloys

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Abstract

In this paper we presented a new method (Eigen-Coordinates (ECs)) that can be used for calculations of the critical points (CPs) energy of the interband-transition edges of the heterostructures. This new method is more accurate and complete in comparison with conventional ones and has a wide range of application for the calculation of the fitting parameters related to nontrivial functions that initially have nonlinear fitting parameters that are difficult to evaluate. The new method was applied to determine the CPs energies from the dielectric functions of the MBE grown GaAs1-xPx ternary alloys obtained using spectroscopic ellipsometry (SE) measurements at room temperature in the 0.5-5 eV photon energy region. The obtained results are in good agreement with the results of the other methods. © 2010 Versita Warsaw and Springer-Verlag Berlin Heidelberg.

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Keywords

critical points energy, Eigen-coordinates method, GaAsP, MBE, spectroscopic ellipsometry