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Phonons in nanostructures

Raman study of interface phonons in InAs quantum dot structures

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Abstract

We present the first experimental study of interface phonons in InAs/Al(Ga)As periodical structures with InAs quantum dots by means of Raman spectroscopy. Experiments on asymmetric GaAs/InAs/AlAs quantum dot structures allowed us to investigate the interface phonons localized in the vicinity of corrugated dot/matrix interface and planar interface between the matrix and wetting layer. Interface phonon modes were also observed in quantum dot structures in which InAs QDs were embedded in an AlGaAs matrix. The IF phonon frequencies in the quantum dot structures determined from the experiment are compared to those calculated in the framework of the dielectric continuum model. (© 2004 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim)

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