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Interface phonons in InAs and AlAs quantum dot structures

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We present an experimental study of InAs/AlAs(GaAs) periodical structures with InAs and AlAs quantum dots by means of Raman spectroscopy. Experiments on the 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. The interface phonon frequencies in the quantum dot structures determined from the experiment are compared to those calculated in the framework of the dielectric continuum model. A good agreement is obtained, especially if the preferential shape of the quantum dots determined from transmission electron microscopy is taken into account.

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