

## Article



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## Electronic Properties of Solids

Interface phonons in semiconductor nanostructures with quantum dots

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**Abstract** The vibrational spectra of structures with InAs quantum dots in an AlGaAs matrix and AlAs quantum dots in an InAs matrix are investigated experimentally and theoretically. The Raman spectra exhibit features that correspond to transverse-optical (TO), longitudinal-optical (LO), and interface phonons. The frequencies of interface phonons in InAs and AlAs quantum dots and in an AlGaAs matrix with various concentrations of aluminum are calculated with the use of experimental values of transverse- and longitudinal-optical phonons in the approximation of a dielectric continuum. It is shown that the model of a dielectric continuum adequately describes the behavior of interface phonons in structures with quantum dots under the assumption that the quantum dots are spheroidal.

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