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Strained InAs/GaAs quantum structures: non-parabolic simulating model. BRANISLAV VLAHOVIC, North Carolina Central University, Durham NC, 27707, IGOR FILIKHIN, VLADIMIR SUSLOV — A single sub-band model for InAs/GaAs quantum dot (quantum ring), taking into account the strain and piezoelectric potentials, is applied to study the electron spectral properties of QD(QR). The finite confinement band-gap potential is estimated by the band gap difference of the InAs quantum object and the GaAs substrate. An additional potential Vs(Vs=const for QD, and Vs=0 for a substrate) is included in the model to simulate the total effect of the strain and piezoelectricity. The non-parabolic approximation is defined by dependence of electron effective mass on the confinement energy according to the Kane formula. The 3D confined energy problem is solved numerically by the finite element method. The adequacy of our model is illustrated by comparing electron energy spectra with *ab initio* calculations [1]. The experimental data by A. Lorke, et al.(PRL **84** 2223 (2000)) for few electrons tunneling into InAs/GaAs QD(QR) are well reproduced within the present model. The non-parabolic effect, which is quite noticeable in our calculations, is also discussed. [1] C. Pryor, PR B **57** 7190 (1998); O. Stier, M. Grundmann, and D. Bimberg, PR B **59** 5688 (1999); J.I. Climente, J. Planelles, F. Rajadell, J. Phys.: Condens. Matter **17** 1573 (2005).

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