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**Simulation of infrared photodetectors from single-electron models**[1] NELSON STUDART, Dept. de Fisica - UFSCar, MARCOS H. DEGANI, MARCELO Z. MAIALLE, FCA - UNICAMP, PAULO F. FARINAS, Dept. de Fisica - UFSCar — We present results from simulations of potential structures with the method of the split operator. The method is applied to solve for electrons in potential profiles that are typical in the description of quantum dot infrared photodetectors. Various quantities of interest are calculated without the necessity of having the energy spectrum, simulating quantities like the photocurrent directly from a model hamiltonian. By using realistic band offset and mass parameters taken from devices, we are able to explain recent exeperimental results by referring to multiple-photon absorptions. In particular, strong resonance peaks observed in the $\sim 10\mu$m wavelength range in recently fabricated InAs quantum dot infrared photodetectors are obtained from the direct use of intrinsic band and mass parameters. Multiphoton scattering of electrons localized in the quantum dots are not only in accordance with the observed patterns, but are also necessary to explain the photocurrent spectrum obtained in the single-electron calculations.

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