

## basic solid state physics

Original Paper

The nonlinear optical absorption and corrections to the refractive index in a GaAs n-type delta-doped field effect transistor under hydrostatic pressure

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## Abstract

The theoretical study of linear and nonlinear optical absorption, and the nonlinear corrections to the refractive index in a GaAs n-type delta-doped field effect transistor is preformed taking into account the effects of applied hydrostatic pressure on the quantum well energy states, the size of the system and the Scottky barrier height. The potential well model includes Hartree and exchange effects via a Thomas-Fermi-based local density approximation. The allowed levels are calculated within the effective mass and envelope function approximations by means of an expansion over an orthogonal set of infinite well eigenfunctions. The results for the linear populators and total entirely



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