

## Bound States and the Third Harmonic Generation in an Electric Field Biased Semi-parabolic Quantum Well

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**Abstract:** Within the framework of the compact density matrix approach, the third-harmonic generation (THG) in an electric-field-biased semi-parabolic quantum well (QW) has been deduced and investigated. Via a variant of displacement harmonic oscillation, the exact electronic states in the semi-parabolic QW with an applied electric field have also been obtained and discussed. Numerical results on typical GaAs material reveal that, electric fields and confined potential frequency of semi-parabolic QW have obvious influences on the energy levels of electronic states and the THG in the semi-parabolic QW systems.

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Key words: third-harmonic generation, semi-parabolic quantum well, density matrix approach

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