

Effect of the Structural Parameters on Subbands of Fibonacci Al_xGa_{1-x}As/GaAs Superlattices

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Abstract : This work is to study the effect of the variation of structural parameters on the band structure in the quasiperiodic Fibonacci superlattices Al_xGa_{1-x}As/GaAs using the formalism of the transfer matrix and Airy function. Our results show that increasing the width of Fibonacci's wells allows to the confinement of subminibands with a widening of minigaps, this causes a consistent and coherent fragmentation. The barrier thickness of Fibonacci b_f acts on the width of subminibands by controlling the interaction force between neighboring eigenstates. Its increase gives rise to singularly extended states. The barrier height Fibonacci V_f permit to control the degree of structural disorder in these structures. The variation of these parameters permits the design of laser with modulated wavelength.

Keywords : transmission coefficient - Quasiperiodic superlattices- singularly localized and extended states- structural parameters- Laser with modulated wavelength

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