

Optimization of Optical Gain in In_xGa_{1-x}Sb/GaSb unstrained quantum well structures

Said Dehimi, Aissat Abdelkaderb, Djamel Haddad, Lakhdar Dehimi

Abstract: In this paper we study the effects of In concentration, temperature, quantum well width and carrier density on optical gain for GaSb/In_xGa_{1-x}Sb/GaSb unstrained quantum well structures. This system was chosen as it is useful in infrared emission, finally, we introduce the optimum structure of quantum well to obtain the maximum optical gain, at room temperature and infrared emission particularly 2.3 (μm), for the use this structure in application of spectroscopic analysis of the gases specially CH₄. This structure can be used for light absorption to increase the solar cell efficiency a based on a quantum well and multi-junction.

Keywords : Quantum well, In_{1-x}Ga_xSb, optical gain, laser, Detection