Opto-Electronics Review, 2015, volume 23, issue 1, pp. 26-29

AlSb and InAs-GaSb layer thickness effect on HH-LH splitting and band gap energies in InAs/AlSb/GaSb type-II superlattices

Alyoruk, M. M.; Ergun, Y.; Hostut, M.

DOI: https://doi.org/10.1515/oere-2015-0001

Abstract:

This study is based on the investigation of AlSb layer thickness effect on heavy−hole light−hole (HH−LH) splitting and band gap energies in a recently developed N−structure based on InAs/AlSb/GaSb type II superlattice (T2SL) p−i−n photodetector.eFirst principle calculations were carried out tailoring the band gap and HH−LH splitting energies for two possible interface transition alloys of InSb and AlAs between InAs and AlSb interfaces in the superlattice. Results show that AlSb and InAs−GaSb layer thicknesses enable to control HH−LH splitting energies to desired values for Auger recombination process where AlSb/GaSb total layer thickness is equal to InAs layers for the structures with InSb and AlAs interfaces.