Turkish Journal of Physics

Turkish Journal

of

Physics

Keywords
Authors

phys@tubitak.gov.tr

Scientific Journals Home Page

3 μ m Intersubband Quantum Well Photodetector (QWIP)

Rita GUPTA, A. L. Y. WONG, S. K. HAYWOOD
School of Engineering, University of Hull,
Hull HU6 7RX UK.

Abstract: In recent years photodetectors operating in the mid- to far infrared region of 3-15 μ m have been designed based on electron and hole intersubband transitions in multiple quantum wells and superlattices. In general, QWIPs based on electron transitions show greater detectivity compared to the hole-based photodetectors. However, selection rules for electron intersubband transitions usually forbid the TE mode operation, associated with normal light incidence; Therefore, special coupling structures/geometries have been employed to couple light into the device. The spectral region 3-5 μ m is of interest for a variety of applications such as environmental gas sensing, thermal imaging etc. and is not well covered by existing detectors. We have grown a QWIP operating at \sim 3μ m with a normal incidence component which incorporates an InGaAs/GaAs asymmetric quantum well from which photo-excited carriers undergo resonant tunnelling into the AlGaAs barriers. A study of temperature-dependent dark current of this device is presented with a view to obtaining enhanced detectivity at high temperatures.

Turk. J. Phys., **23**, (1999), 673-680.
Full text: pdf
Other articles published in the same issue: Turk. J. Phys.,vol.23,iss.4.