Abstract Submitted
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Pl and structural characterization of InAsSb/InAs MQWs grown on GaSb for infrared detector applications[1] DAVID LACKNER, Simon Fraser University, OLIVER J. PITTS, TOM CHERNG, MICHAEL STEGER, ALBION YANG, MICHAEL L.W. THEWALT, SIMON P. WATKINS — $InAs_{0.91}Sb_{0.09}$, epitaxially grown on GaSb, has received steady attention in the past few years for optical detectors in the 3-5micron range. Attempts to increase the detection wavelength by increasing the Sb mole fraction have been hindered by the lack of lattice-matched substrates. In this work we report the growth of strain balanced InAs/InAsSb superlattice structures strain-balanced to GaSb for potential application in photodetectors beyond 5 microns. The strain balanced method permits the incorporation of larger Sb mole fractions in the Sb layers, considerably extending the absorption cutoff. We find the PL-energy of the InAsSb/InAs MQW stack to depend linearly on the Sb mole fraction for samples with Sb compositions ranging from 14% to 21%. At the latter composition a PL energy of 175 meV (7 μm) is measured which is more than 100 meV lower than the calculated strained bandgap. Most likely this can be explained by a type II band-alignment. Also first detector results for a pin InAsSb device, lattice matched to GaSb, will be presented.

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