Abstract Submitted
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Deep Level Defects in Epitaxial GaAsBi/GaAs[1] ZENAN JIANG, Simon Fraser University, D.A. BEATON, R.B. LEWIS, University of British Columbia, I. KOSLOW, X.D. CHEN, Simon Fraser University, T. TIEDJE, University of Victoria, P.M. MOONEY, Simon Fraser University — Bismuth incorporation in GaAs produces a much larger reduction in the band gap than In or Sb alloying, for the same increase in lattice constant. However, Bi is incorporated only at growth temperatures $<400\,^{\circ}$C, making deep level defects a concern. Both GaAs layers and p-i-n structures containing a GaAsBi quantum well in the i-layer having a bismide fraction up to 4.7% were grown by molecular beam epitaxy in the range 285-580 $^{\circ}$C. Deep level transient spectroscopy (DLTS) measurements of GaAs layers show several different traps, depending on the doping type and growth temperature, but all in concentration $<5\times10^{14}$ cm^{-3}. Similarly, the DLTS spectra from p-i-n devices vary with the growth conditions and with the bismide fraction and trap concentrations are $<1\times10^{15}$ cm^{-3}. These DLTS results are consistent with strong photoluminescence[2] and electroluminescence[3] from GaAsBi quantum wells having bismide fraction $\leq$5%. The properties of these traps will be discussed.

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[2]X. Lu, et al., Appl. Phys. Lett. **95**, 041903 (2009).
[3]R.B.Lewis, et al. J. Crystal Growth **311**, 1872-75 (2009)

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