Abstract Submitted
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Measurement of Electron Effective Mass in $GaAs_{1-x}Bi_x$[1] BRIAN FLUEGEL, RAJEEV KINI[2], AARON PTAK, DAN BEATON, KIRSTIN ALBERI, ANGELO MASCARENHAS, National Renewable Energy Laboratory — Magnetic field and temperature dependent resistivity measurements on n-type $GaAs_{1-x}Bi_x$ epitaxially grown films show clear Shubnikov de Haas oscillations in the range $0 \leq x \leq 0.0088$. An overall decrease in the electron effective mass is observed for this range of compositions. Accounting for the known giant bandgap bowing of $GaAs_{1-x}Bi_x$, the measured changes in the electron effective mass are in qualitative agreement with perturbation theory applied to the known bandgap reduction for this alloy, confirming that bismuth mainly perturbs the valence band. The stronger compositional dependence of the measured masses is attributed to effects from the bismuth isolated state.

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