Abstract Submitted
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Coherent longitudinal optical phonon and plasmon coupling in the near-surface region of InN Y.-M. CHANG, C. T. CHUANG, National Taiwan University, C. T. CHIA, National Taiwan Normal University, K. T. TSEN, Arizona State University, H. LU, W. J. SCHAFF, Cornell University — Coherent phonon spectroscopy of a high-quality InN epitaxial layer is carried out using time-resolved second-harmonic generation. Only coherent longitudinal optical phonon and plasmon coupling mode at 447 cm^{-1} can be resolved in the spectrum. Its frequency shows no dependence on the photoinjected carrier density up to 1.5×10^{19} cm^{-3}. This phenomenon is attributed to the hybridization of coherent A_1(LO) phonon with the intrinsic cold plasma accumulated in the near-surface region of InN, where the plasma density could reach the order of 10^{20} cm^{-3}, much higher than the bulk carrier concentration, 1×10^{18} cm^{-3}, determined by Hall effect measurement..

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