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Line width resonance of the longitudinal optical phonon in GaAs:N ALEKSEJ MIALITSIN, ANGELO MASCARENHAS, NREL — We extend resonant Raman scattering studies of Mascarenhas et al. [PRB68, 233201 (2003)] of $GaAs_{1-x}N_x$ to the ultra-dilute nitrogen doping concentrations, whereby we unambiguously resolve the line width resonances of the LO phonon. A discontinuity is observed in the LO phonon line width resonance energy as a function of concentration. With decreasing nitrogen concentration the E_W line width resonance energy reduces by ca. 40 meV at $x = 0.4\%$. This value corresponds to the concentration, at which the localized to delocalized transition manifests itself in the electro-reflectance signature line widths.

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