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Concentration dependence of the $\mathbf{E_+}$ transition in dilute $\mathbf{GaAs_{1-x}N_x}$ alloy. B. FLUEGEL, A. PTAK, A. MASCARENHAS, National Renewable Energy Laboratory, S. TIXIER, E. C. YOUNG, T. TIEDJE, University of British Columbia, Department of Physics and Astronomy — We investigate dilute isoelectronic doping in molecular-beam epitaxially-grown GaAs using low-temperature micro-photoluminescence to measure the above-bandgap transition energies of E_+ and the spin-orbit transition, E_{SO}. In the case of dilute nitrides, $GaAs_{1-x}N_x$, we examine the functional shape of the concentration dependence of $E_+(x)$ in the low-x limit, with x as low as 0.04 %. Comparison with the concentration dependence of the E_0 bandgap gives compelling evidence against the picture of bandgap reduction via repulsion of the conduction band minimum from the impurity level acting alone.

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