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Title:Picosecond carrier lifetimes in dilute GaInNAs grown on InP substrate

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Abstract:We study the carrier relaxation dynamics in Ga1-yIny N0.03As0.97 layers grown on InP substrate by molecular beam epitaxy. This dilute nitride semiconductor is a potential candidate for ultrafast components such as photoconductive terahertz devices driven at 1.55 um wavelength. Carrier lifetimes are measured by pump-probe experiments at 1550 nm wavelength and the shortest carrier lifetime is 2.6 ps under photoexcitation with ~4.2 uJ/cm2. We observe two contributions in the differential transmittance decay. These contributions are discussed in terms of photocarrier recombination processes.

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