

Department of Electrical and Computer Engineering

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Ph.D. Public Defense

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Time-resolved characterization of non-equilibrium carrier dynamics in Gallium based III-V materials and devices

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Ga-based III-V materials, such as, GaAs, GaN and AlGa_N, have wide-range applications in the fields of high-speed, high-temperature, high-power and high-frequency electronic and optoelectronic devices, due to their unique physical properties. This thesis is devoted to the time-resolved characterization of ultrafast, nonequilibrium carrier and phonon dynamics in Ga-based III-V materials and their devices. I present my studies of coherent acoustic phonons (CAPs) and nonlinear optical (NLO) process in GaN and AlGa_N single crystals, as well as the ultrafast characterization of epitaxially-grown GaAs meso-structured