

KROTKUS, ARUNAS

(Center for Physical Sciences and Technology, Vilnius, Lithuania)

GaBiAs epitaxial layers for terahertz optoelectronic applications

Abstract: GaBiAs layers with BiAs content of approximately 5% grown by the molecular-beam-epitaxy on GaAs at relatively low substrate temperatures from 250 to 320°C were found to have sub-picosecond carrier lifetimes, larger than 2000 cm²/Vs electron mobilities, and rather high, considering their small energy bandgap resistivities ($\rho > 10^4$ Wcm). This unique set of parameters makes dilute bismides a prospective material for ultrafast optoelectronic applications. In this talk we will describe the characteristics of terahertz time-domain spectroscopy systems that are using photoconductive components manufactured from GaBiAs layers and are activated by femtosecond Yb-doped solid-state or fiber lasers. It has been demonstrated that the photoconductors manufactured from GaBiAs can be used as efficient THz range optical mixers. Investigations of the physical origin of ultrafast non-equilibrium carrier recombination in low-temperature-grown GaBiAs will be also presented.