CARRIER DENSITY AND TRANSPORT GOVERNED OPTICAL NONLINEARITIES IN BULK SEMICONDUCTORS

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S u m m a r y

Development of four-wave mixing techniques on free carrier and photorefractive transient gratings in bulk semiconductor materials is given. Experimental studies together with numerical modeling allowed us to demonstrate a feasibility of the nanosecond and picosecond dynamic grating techniques for the control over semiconductor wafer quality, to investigate the room-temperature photoquenching of EL2 defects in GaAs, as well as to reveal conditions for the very effective feedback effect of a space-charge field on the carrier transport in variously doped GaAs, CdTe, and ZnTe crystals.