

246. Title: Laser methods for generating megavolt terahertz pulses

Author: Garnov SV. Shcherbakov IA.

Source: Physics-Uspekhi

Volume:54

Issue:1

Publication year: 2011

Pages: 91-6.

Abstract: Laser sources of pulsed terahertz radiation of ultrashort duration were devised, which make it possible to obtain record high electric field intensity - over 10^6 V cm⁻¹. The achieved megavolt intensity level of the terahertz field opens up exciting possibilities for a new line of investigation in physics - the nonlinear optics of terahertz waves, which has recently begun to progress rapidly due to the advent of new compact laser sources of high-intensity terahertz pulses. Fundamentally, the technique of the optical rectification of femtosecond laser pulses with a tilted intensity front in nonlinear crystals permits generating single-cycle picosecond terahertz pulses with an even higher energy (over 100 mJ) and higher field intensity amplitude (up to 10^9 V cm⁻¹). Such pulses may be obtained in the presently existing multiterawatt laser facilities, in particular, in the Luch facility at the Institute of Laser Physics Research of the Russian Federation Nuclear Center 'All-Russian Research Institute of Experimental Physics' (Sarov).