539.

Author

Didenko AN. Rashchikov VI.

Tittle

Mechanism of generation of high-intensity terahetrz radiation under the action of high-power laser pulsed on a target

Source

TECHNICAL PHYSICS vol.56 no.10 1535-1538 DOI: 10.1134/S1063784211100069 OCT 2011

Abstract

The mechanism of generation of terahertz radiation upon irradiation of a target by short (similar to 0.1 ns) high-intensity laser pulses (I similar to 10(18)-10(19) W cm(-2)) is investigated by numerical simulation using the relativistic electromagnetic PIC code. The interaction of such a pulse with the target, a plasma is formed on it. Electrons emitted from the plasma form a virtual cathode whose oscillations are determined not only by their self-field, but also by the field of ions of the plasma. Generation occurs in the terahertz frequency range with the efficiency thrice as high as in the absence of ions (i.e., with traditional reditron generation mechanism). The explanation for this effect is also given.