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Title

On possibility of high-power terahertz emission from target under the action of powerful laser pulses

Source

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Abstract

The possibility of terahertz (THz) emission from a target irradiated by short (~0.1 ns) high-intensity (I ~ 10¹⁸-10¹⁹ W/cm²) laser pulses has been studied by numerical simulations using a relativistic electromagnetic PIC code. The laser pulse action on the target generates plasma and the runaway electrons form a virtual cathode, which oscillates in the intrinsic field of electrons and the field of plasma ions. These oscillations account for the emission of radiation in a THz range. The generation efficiency is about three times as high as that in the absence of ions (according to the conventional reditron mechanism). Explanation of the observed phenomena is proposed. (2 References).