

# Powerful laser-produced unipolar THz pulses

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High energy terahertz pulses with an ultrabroad spectral bandwidth attract a lot of attention due to the large number of applications in various fields of science and technology. In this report, we present an analytical solution of the Maxwell equations related to the transition radiation of an electron bunch crossing the metal-vacuum boundary, which clearly demonstrates that strong terahertz radiation appears in the form of unique half-period pulses [1]. Several examples of the generation of high-power THz pulses arising from the interaction of a short relativistic laser pulse with different targets (thin foil, near-critical plasma, metal wire) are presented and discussed.

[1] Kuratov A S, Brantov A V, Kovalev V F and Bychenkov V Y 2022 *Phys. Rev. E* **106** 035201