

Bursts of terahertz radiation from relativistic laser-plasma interactions

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Terahertz (THz) radiation has attracted increasing attention over last decades for its wide promising applications in many interdisciplinary fields of research. Fundamentally high power THz sources enable one to access to nonlinear THz photonics. Since the plasma is a medium free of a damage threshold, laser-plasma interactions provide a unique opportunity to achieve tabletop high-field THz radiation sources. Recently some experiments and models have been reported on the THz emissions generated from ultra-intense laser interactions with solid targets. In this presentation, we will show generation of coherent THz transition radiation by relativistic laser-accelerated electrons crossing the rear surface of a thin

solid target. To verify the generation mechanism, various target parameters and structures are adopted to characterize the THz radiation properties and to distinguish the proposed mechanism from others. The model of transition radiation and particle-in-cell simulations well explain the observations. The presented laser-solid based THz transition radiation provides a new approach toward compact brilliant THz sources.

1. *G. Q. Liao et al.* Plasma Phys. Control. Fusion 59, 014039 (2017).

2. *G. Q. Liao et al.* Phys. Rev. Lett. 116 205003 (2016).