

P1.2025 Diagnostic of forward fast electrons in femtosecond laser-foil interactions using terahertz radiation

Monday, 8 July 2019 14:00 (2 hours)

See the full abstract here:

<http://ocs.ciemat.es/EPS2019ABS/pdf/P1.2025.pdf>

Fast electrons are important for laser-driven x-ray sources, proton acceleration and fast ignition of the inertial confinement fusion. Fast electrons in a solid target can be diagnosed with x-ray emission, proton acceleration and optical transition radiation. However, it is quite challenge to measure their temporal evolution. Recently Terahertz (THz) emission from intense-laser-produced plasmas has attracted much interest since such an emitter could not only be a potential tabletop brilliant THz source, but also a noninvasive diagnostic for fast electrons. We have systematically studied THz radiation from solid targets driven by relativistic laser pulses and found that THz can be generated due to coherent transition radiation (CTR) of the forward fast electrons when they pass the solid-vacuum boundary. We will show using the THz CTR to characterize the temporal history, charge, and divergence angle of the fast forward fast electron beam in a solid target in this presentation.

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Presenter: LI, Y. (EPS 2019)

Session Classification: Poster P1

Track Classification: BPIF