

Abstract Submitted  
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**Shaping the Spectrum of Hot Electrons using Structured Targets<sup>1</sup>**

SHENG JIANG, ANDREW KRYGIER, DOUGLASS SCHUMACHER, RICHARD FREEMAN, KRAMER AKLI, The Ohio State University — Hot electron generation is a crucial aspect of the intense laser solid interaction. Proper energy and angular distributions of the fast electrons greatly benefit subsequent processes such as X ray/gamma ray production and ion acceleration. Fast electrons generated using simple flat targets are large in charge, but usually have high divergence, low energy and broad spectrum, which limit the efficacy of their applications. We have used 3D LSP PIC simulations to develop a way to generate high energy, low divergence electrons using structures (spikes or fins) on the target front surface. When an intense, ultra-fast laser pulse interacts with these structures, electrons at the tip are accelerated via direct laser acceleration to energies much higher than the ponderomotive energy. The electric and magnetic fields from these super-hot electrons and the return current inside the structures guide the electrons, leading to a small divergence angle. Varying the structure shape can further tune the electron spectrum.

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