

Abstract Submitted
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Improving Laser/Plasma Coupling with Rough Surfaces¹ KERRY HIGHBARGER, The Ohio State University, RICH STEPHENS, EMILIO GIRALDEZ, General Atomics, RICHARD FREEMAN, LINN VAN WOERKOM, The Ohio State University — In the Fast Ignition scenario the photons from a petawatt laser are converted into electrons at a solid surface typically with 30% efficiency. Recent experiments have shown this can be doubled with the use of a rough surface. For Fast Ignition targets, we wish to produce rough surfaces on the inside tip of a narrow cone. We can produce the needed structure in that confined space by making the cone on a plastic mandrel and roughening its surface with particle track etching. To achieve a surface of desired roughness requires exposure to 10^{10} ions/cm² with ion energies in the range of 0.5 to 2MeV/nucleon and weights ranging from Si to Zn. Conical pits are then etched into the plastic with a height to diameter ration of 3 to 1 and the resulting surfaces replicated by sputter coating the plastic with metal and then etching the plastic away.

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