

Abstract Submitted
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Dynamically controlled generation of plasma structures using a spatial light modulator¹ GEORGE HINE, SUNG JUN YOON, ANDREW GORERS, JENNIFER ELLE, HOWARD MILCHBERG, Institute for Research in Electronics and Applied Physics, University of Maryland College Park — Axially modulated plasma waveguides have been proposed as a means of quasi-phase matching direct laser acceleration of electrons. We demonstrate the formation of a modulated plasma structure using an intense laser patterned by a Spatial Light Modulator (SLM) in a coherent combination scheme. Detailed intensity patterns are formed by phase-masking a sample of an intense pulse with an SLM and recombining it with the parent pulse. A 500 mJ 100ps pulse is prepared with intensity modulations deeper than 20% by passing less than 5% of the total energy through the SLM. This allows the SLM to sculpt a laser pulse that is well above the SLM damage threshold. We show dynamic control of waveguide axial modulation period, shape, and depth with good sensitivity and repeatability.

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