

Abstract Submitted  
for the DPP15 Meeting of  
The American Physical Society

**Plasma photonics in ICF & HED conditions**<sup>1</sup> PIERRE MICHEL, DAVID TURNBULL, LAURENT DIVOL, BRADLEY POLLOCK, CECILIA Y. CHEN<sup>2</sup>, ELEANOR TUBMAN<sup>3</sup>, CLEMENT S. GOYON, JOHN D. MOODY, LLNL — Interactions between multiple high-energy laser beams and plasma can be used to imprint refractive micro-structures in plasmas via the lasers' ponderomotive force. For example, Inertial confinement fusion (ICF) experiments at the National Ignition Facility already rely on the use of plasma gratings to redirect laser light inside an ICF target and tune the symmetry of the imploded core. More recently, we proposed new concepts of plasma polarizer and waveplate, based on two-wave mixing schemes and laser-induced plasma birefringence. In this talk, we will present new experimental results showing the first demonstration of a fully tunable plasma waveplate, which achieved near-perfect circular laser polarization. We will discuss further prospects for novel “plasma photonics” concepts based on two- and four-wave mixing, such as optical switches, bandpass filters, anti-reflection blockers etc. These might find applications in ICF and HED experiments by allowing to manipulate the lasers directly in-situ (i.e. inside the targets), as well as for the design of high power laser systems.

<sup>1</sup>This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

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Date submitted: 24 Jul 2015

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