

Bulletin of the American Physical Society

63rd Annual Meeting of the APS Division of Plasma Physics

Volume 66, Number 13

Monday–Friday, November 8–12, 2021; Pittsburgh, PA

Session PP11: Poster Session VI:

BEAMS- Computational, Analytical, Measurement, and Diagnostic Techniques for Lasers and Beams, Laser-Plasma Wakefield, Beam-Plasma Wakefield, and Direct Laser Accelerators

Low Temperature Plasma

MFE- Edge and Pedestal Stellarators

Mini-Conference on Machine Learning

2:00 PM - 5:00 PM

Wednesday, November 10, 2021

Room: Hall A

Abstract: PP11.00025 : Fabrication of waveguides in flexible glass via femtosecond laser micromachining and visualization of ultrafast dynamics of the laser-glass interaction *

← Abstract →

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We fabricate waveguides in Corning® flexible glass using Femtosecond Laser Micromachining (FLM) and visualize the ultrafast plasma dynamics which lead to waveguide formation via time-resolved interferometry. Due to minimal thermal effects and highly-nonlinear optical processes [1], FLM is an ideal tool to fabricate waveguides in glass with high precision and without post processing. We optimize laser fabrication of waveguides by varying scanning speed and pulse energy and, in particular, achieve waveguides with circular cross-sections using slit beam shaping [2]. Further optimization requires investigation of the underlying dynamics of how structural changes in glass are made during and after laser-glass interactions. Thus, we visualize the creation and recombination of plasma in glass which leads to the formation of waveguides using time- resolved interferometry [3].

[1] Rafael R. Gattass and Eric Mazur, Nature Photonics 2, 219–225 (2008); [2] M. Ams et al. Opt. Express 13, 5676-5681 (2005); [3] G. C. Nagar, D. Dempsey, and B. Shim, Communications Physics 4, 96 (2021).

*Funded by Air Force Office of Scientific Research (AFOSR)(FA9550-18-1-0223), National Science Foundation (NSF) (PHY-2010365) and the Integrated Electronics Engineering Center (IEEC) at Binghamton University