Abstract Submitted
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Single-shot ultrafast visualization of plasma dynamics and nonlinear index of refraction in flexible glass using frequency domain holography[1] DENNIS DEMPSEY, GARIMA NAGAR, CHRISTOPHER RENSKERS, ROSTISLAV GRYNKO, Binghamton University, JAMES SUTHERLAND, Corning, BONGGU SHIM, Binghamton University — We measure the nonlinear index of refraction (n_2) and investigate plasma dynamics in flexible Corning® Willow® Glass using single-shot Frequency Domain Holography (FDH) [1,2]. Flexible glass has received a lot of attention recently due to various applications such as 3-D photonics [3] and wearable devices. Femtosecond laser micromachining (FLM) is a viable tool to fabricate these devices because of minimal thermal effects and thus enables fabrication of small and clean 3-D structures. To control and understand the underlying dynamics of FLM, ultrafast visualization of plasma and optical Kerr effect is important. FDH is a robust femtosecond time-resolved technique in which chirped reference and probe pulses centered at 404 nm are used to measure and visualize the plasma and Kerr effect produced by an intense, ultrashort pump pulse centered at 808 nm. Using FDH, we study laser-matter interactions in Willow Glass and measure its n_2 to be $3.41 \pm 0.08 \times 10^{-16} \mathrm{cm}^2/\mathrm{W}$ and visualize the plasma dynamics. [1] S. P. Le Blanc et al., Opt. Lett. 56, 764-766 (2000). [2] Kim et al., APL, 88 4124-4126 (2002). [3] S. Huang et. al., OFC 1-3 (2014).

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