

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Observations of laser plasma induced refractive index variations ANTHONY VALENZUELA, US Army Research Laboratory, GEORGE RODRIGUEZ, Los Alamos National Laboratory — Intense laser light focused in air is well known to generate a plasma spark. The density of liberated electrons from the plasma creates a change to the index of refraction. By propagating a laser probe perpendicular to the plasma generating pump laser beam, we can measure the effects of the change to the index of refraction. Similar work in Ref 1 shows a large increase of the index of refraction outside the plasma region generated by a nanosecond laser pulse. The index increase was attributed to a probe-induced macroscopic electric polarization in the sheath resulting in a higher sheath region susceptibility. We made similar observations closer into the center of the plasma region to map out the radial variation of the index of refraction with temporal resolution. Our observations show a less remarkable change to the index of refraction. This will have an impact on optical probing of atmospheric plasma phenomena such as plasma filaments.

1. A. Robledo-Martinez, *etal.* Phys. Plasma 15, 093510 (2008)

Anthony Valenzuela
US Army Research Laboratory

Date submitted: 16 Jul 2010

Electronic form version 1.4