## Abstract Submitted for the DPP11 Meeting of The American Physical Society

Plasma as ultra-fast optical switch using relativistic transparency SASIKUMAR PALANIYAPPAN, RAHUL SHAH, HUI WU, Los Alamos National Laboratory, DANIEL JUNG, Ludwig-Maximilians-Universität München, DONALD GAUTIER, LIN YIN, BRIAN ALBRIGHT, RANDALL JOHNSON, TSUTOMO SHIMADA, SAMUEL LETZRING, JUAN FERNANDEZ, BJORN HEGELICH, Los Alamos National Laboratory, LOS ALAMOS NATIONAL LABORATORY TEAM, LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN TEAM — Laserplasma interaction leading to relativistic transparency (RT) in 100 nm thick Diamond-Like-Carbon (DLC) nanofoil has been directly observed at an intensity of 2 10<sup>20</sup> W/cm<sup>2</sup> by measuring the shape and temporal phase of the pulse reflected from the plasma using a single shot Frequency-Resolved-Optical-Gating (FROG). The reflected light intensity drops sharply at the onset of RT with its temporal phase capturing the time dependant interaction dynamics. The corresponding spectrum is shifted to the red side extending up to  $\sim 100$  nm from the laser light pressure rapidly moving the critical surface away from the laser. Results from a 2D-VPIC simulation are very well consistent with measurements.

> Sasikumar Palaniyappan Los Alamos National Laboratory

Date submitted: 18 Jul 2011 Electronic form version 1.4