

Abstract Submitted
for the DAMOP14 Meeting of
The American Physical Society

Time-resolved measurements of two-pulse enhanced ionization

JENNIFER ELLE, SINA ZAHEDPOUR, JARED WAHLSTRAND, HOWARD MILCHBERG, University of Maryland — Recent measurements have found greatly enhanced fluorescence in atmospheric density gases when two temporally separated ultrashort pulses are used [1]. We explore two-pulse ionization in xenon using supercontinuum spectral interferometry. This technique allows a time resolved measurement of absolute electron densities for inter-pulse delays from 200 fs to 50 ps, from the ionization threshold of neutral xenon to a mostly Xe^+ plasma. Use of a thin gas target allows careful characterization and control of the pulse intensities and neutral gas densities. We find that the ionization rate from the second pulse depends strongly on the time delay between the two pulses and the ionization fraction due to the first pulse. Notably, it is possible with the two-pulse configuration to ionize with the second pulse at intensities below the single pulse ionization threshold of neutral Xe.

[1] L. Shi, W. Li, Y. Wang, X. Lu, L. Ding, and H. Zeng, Phys. Rev. Lett. 107, 095004 (2011)

Jennifer Elle
University of Maryland

Date submitted: 31 Jan 2014

Electronic form version 1.4