

Abstract Submitted  
for the NEF19 Meeting of  
The American Physical Society

**Nonlinear Optical Properties of Gold Nanostructures at Strong Laser Excitation** ZIBO WANG, MENGYAN SHEN, ZHE KAN, Univ of Mass - Lowell — This research showed positive results that the surface plasmonic effect holds at extreme femtosecond laser fluence. Hole burning experiments and measurement of optics constant at extreme intensity suggested damping factor is tripled at  $10^7$  J/m<sup>2</sup> fluence, which suggested a remaining 10% plasmonic enhancement efficiency at such intensities, which is explained using quantum field theories. Single pulse hole burning experiment performed in a mixture of nanorods with a broad absorption around 800 nm with a 35 fs laser with 800 nm wavelength and 6 mJ per pulse. Optic constants were obtained by measuring single pulse transmission and reflection data from a free-standing gold film that could move along a stage. Those results allow future research of creating neutron beam by irradiating gold nanostructures in deuterated materials.

Zibo Wang  
Univ of Mass - Lowell

Date submitted: 26 Sep 2019

Electronic form version 1.4