

Abstract Submitted  
for the DPP15 Meeting of  
The American Physical Society

**Broadband AC Conductivity of XUV Excited Warm Dense Gold**

Z. CHEN, SLAC National Accelerator Laboratory, Y. TSUI, University of Alberta, S. TOLEIKIS, DESY, Germany, P. HERING, S. BROWN, C. CURRY, SLAC National Accelerator Laboratory, T. TANIKAWA, H. HOEPPNER, DESY, Germany, M. LEVY, University of Oxford, S. GOEDE, SLAC National Accelerator Laboratory, B. ZIAJA-MOTYKA, DESY, Germany, B. RETHFELD, University of Kaiserslautern, VANINA RECOULES, CEA, France, A. NG, University of British Columbia, S. GLENZER, SLAC National Accelerator Laboratory — The properties of ultrafast laser excited warm dense gold have been extensively studied in the past decade [1, 2]. In those studies, a 400nm ultrashort laser pulse was used to excite the  $5d$  electrons in gold to  $6s/p$  state. Here we will present our recent study of warm dense gold with 245eV, 70fs pulses to selectively excite  $4f$  electrons using the XUV-FEL at FLASH. The AC conductivity of the warm dense gold was measured at different wavelengths (485nm, 520nm, 585nm, 640nm and 720nm) to cover the range from  $5d$ - $6s/p$  interband transitions to  $6s/p$  intraband transitions. Preliminary result suggests that the onset of  $5d$ - $6s/p$  band transition shifts from 2.3eV to  $\sim 2$ eV, which is in agreement with the study of 400nm laser pulse excited warm dense gold [3]. More detailed analysis of our data will also be presented.

- [1] Z. Chen *et. al*, *PRL* **110**, 135001 (2013)
- [2] T. Ao *et. al*, *PRL* **96**,055001 (2006)
- [3] Y. Ping *et. al*, *PRL* **96**, 255003 (2006)

Zhijiang Chen  
SLAC National Accelerator Laboratory, Menlo Park, CA, USA

Date submitted: 25 Jul 2015

Electronic form version 1.4