Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

kHz tabletop coherent soft X-ray source enabled by single-stage 10 mJ Ti:sapphire amplifier CHENGYUAN DING, WEI XIONG, TINGTING FAN, DANIEL HICKSTEIN, HENRY KAPTEYN, MARGARET MURNANE, JILA - NIST and Department of Physics, University of Colorado, KAPTYEN AND MURNANE TEAM — We present a tabletop source of bright, broadband, soft X-rays with photon energies up to 300 eV. By driving the harmonic generation process using 1.3 μm light in a high-pressure, phase matched geometry, we significantly enhance the soft X-ray flux and stability. We achieve a photon flux $>10^8$ photons/s/1% bandwidth, which emerges as a soft x-ray supercontinuum. Utilizing this broad bandwidth, we can implement high-quality x-ray absorption spectroscopy of multiple elements and transitions in a single spectrum. Near edge fine structure is obtained from molecular samples (CS_2 and SF_6). Furthermore, we demonstrate the applicability of this source to transient absorption studies by measuring the transient soft X-ray absorption of xenon plasma with high spectral sensitivity and femtosecond temporal resolution.

Chengyuan Ding
JILA - NIST and Department of Physics, University of Colorado

Date submitted: 15 Nov 2013 Electronic form version 1.4