Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Tomographic Reconstruction of Circularly Polarized High Harmonic Fields: 3D Attosecond Metrology CONG CHEN, ZHENSHENG TAO, JILA, University of Colorado Boulder, CARLOS HERNNDEZ-GARCA, Universidad de Salamanca, Spain, PIOTR MATYBA, ADRA CARR, RONNY KNUT, JILA, University of Colorado Boulder, OFER KFIR, Technion, Haifa, Israel, DIMITRY ZUSIN, CHRISTIAN GENTRY, PATRICK GRYCHTOL, JILA, University of Colorado Boulder, OREN COHEN, Technion, Haifa, Israel, LIUS PLAJA, Universidad de Salamanca, Spain, ANDREAS BECKER, AGNIESZKA JARON-BECKER, HENRY KAPTEYN, MARGARET MURNANE, JILA, University of Colorado Boulder — Bright, circularly polarized, extreme ultraviolet (EUV) and soft X-ray high harmonic beams can now be produced using counter-rotating circularly polarized driving laser fields. In the time domain, the field is predicted to emerge as a complex series of rotating linearly polarized bursts, varying rapidly in amplitude, frequency and polarization. Here, we extend attosecond metrology techniques to circularly polarized light for the first time by simultaneously irradiating a copper surface with circularly polarized high harmonic and linearly polarized infrared laser fields. The resulting temporal modulation of the photoelectron spectra carries essential phase information about the EUV field. Utilizing the polarization selectivity of the solid surface and by rotating the circularly polarized EUV field in space, we fully retrieve the amplitude and phase of the circularly polarized harmonics, allowing us to reconstruct one of the most complex coherent light fields produced to date.

Ronny Knut
JILA, University of Colorado Boulder

Date submitted: 06 Nov 2015 Electronic form version 1.4