

## THU2P • Ultrafast Diagnostics

*Panoramica***10:45–12:30****THU2P • Ultrafast Diagnostics***Chair: Rick Trebino, Georgia Institute of Technology, Swamp Optics, LLC, Atlanta, USA***THU2P.1 • 10:45****Single-shot carrier-envelope phase measurement of few-cycle laser pulses**, •Tibor Wittmann<sup>1</sup>, Balint Horvath<sup>1</sup>, Wolfram Helm<sup>1</sup>, Michael Schätzel<sup>1</sup>, Xun Gu<sup>1</sup>, Adrian L Cavalieri<sup>1</sup>, Gerhard G Paulus<sup>2,3</sup>, and Reinhard Kienberger<sup>1</sup>;<sup>1</sup>Max-Planck-Institut für Quantenoptik, D-85748 Garching,<sup>2</sup>Institute of Optics and Quantum Electronics, Friedrich-Schiller-University, 07783 Jena, Germany,<sup>3</sup>Department of Physics, Texas A&M University, College Station, Tx 77843.

Above-threshold ionization spectra of rescattered electrons were captured using a single-shot stereo-ATI phase meter, allowing measurement of the carrier-envelope phase of individual laser pulses, consecutively, and at multi-kHz repetition rate for the first time.

**THU2P.2 • 11:00****Strong-Field Momentum State Mapping**, Xinhua Xie<sup>1</sup>, Armin Scrinzi<sup>1</sup>, Marlene Wickenhauser<sup>1</sup>, Andrius Baltuska<sup>1</sup>, Ingo Barth<sup>2</sup>, and •Markus Kitzler<sup>1</sup>; <sup>1</sup>Photonics Institute, Vienna University of Technology, Austria, <sup>2</sup>Institute for Physical and Theoretical Chemistry, Free University of Berlin, Germany.

We numerically demonstrate novel features in both ionization and high-harmonic generation from bound states with a net internal angular momentum. Applications such as creation of circularly polarized attosecond X-ray pulses are discussed.

**THU2P.3 • 11:15****Optical mapping of attosecond ionization dynamics by few-cycle light pulses**, Aart Jan Verhoeft<sup>1</sup>, Alexander Mitrofanov<sup>1</sup>, Aleksei Zheltikov<sup>2</sup>, •Andrius Baltuska<sup>1</sup>, and Evgeny Serebryannikov<sup>2</sup>; <sup>1</sup>Vienna University of Technology, <sup>2</sup>Moscow State University.

Few-cycle light pulses are used to map ultrafast ionization dynamics in time and frequency domains by all-optical means. Tunneling ionization encodes an attosecond phase mask, suggesting a method for attosecond shaping of high-intensity optical fields.

**THU2P.4 • 11:30****Polarization, Phase and Amplitude Control and Characterization of Ultrafast Laser Pulses**, •Philip Schlup<sup>1</sup>, Omid Masihzadeh<sup>1</sup>, Lina Xu<sup>2</sup>, Rick Trebino<sup>2</sup>, and Randy A. Bartels<sup>1</sup>; <sup>1</sup>Colorado State University, Department of Electrical and Computer Engineering, Fort Collins CO 80523, USA, <sup>2</sup>School of Physics, Georgia Institute of Technology, Atlanta GA 30332, USA.

We demonstrate complete control over the polarization, phase and amplitude state of an ultrafast laser pulse using a single, linear spatial light modulator, and introduce a self-referenced method for characterization the polarization state.

**THU2P.5 • 11:45****Silicon-Chip-Based Single-Shot Ultrafast Optical Oscilloscope**, •Mark Foster, Reza Salem, David Geraghty, Amy Turner, Michal Lipson, and Alexander Gaeta; Cornell University, Ithaca, NY, USA.

We demonstrate a single-shot ultrafast optical oscilloscope using a four-wave-mixing-based parametric temporal lens integrated on a CMOS-compatible silicon photonic chip. Experimentally, we demonstrate waveform measurement with a 100-ps record length and sub-750-fs resolution.

**THU2P.6 • 12:00****Time-resolved off-axis digital holography for characterization of ultrafast phenomena in water**, •Tadas Balciunas<sup>1</sup>, Andrius Melninkaitis<sup>1</sup>, Gintaras Tamosauskas<sup>2</sup>, and Valdas Sirutkaitis<sup>1</sup>; <sup>1</sup>Laser Research Centre, Vilnius University, Vilnius LT-10223, Lithuania, <sup>2</sup>Department of Quantum Electronics, Vilnius University, Vilnius LT-10222, Lithuania.

We present the application of time-resolved off-axis digital holography for the investigation of refractive index properties of laser-induced plasma filaments in water. The propagation of femtosecond laser pulse was characterized using time-resolved off-axis digital holography.

**THU2P.7 • 12:15****3 GHz RF Streak Camera for Diagnosis of sub-100 fs, 100 keV Electron Bunches**, •Thijs van Oudheusden, Jacco Nohlmans, Willem Op 't Root, and Jom Luiten; Department of Applied Physics, Eindhoven University of Technology, P.O. Box 513, 5600 MB Eindhoven, The Netherlands.

We have designed and built a 3GHz radio-frequency cavity for use as an ultrafast streak camera to measure with 20fs resolution the duration of electron bunches that are suitable for single-shot ultrafast electron diffraction experiments.