International Journal of Optics

Special Issue on Ultrafast Pulse Beamlines and Diagnostics in the Extreme Ultraviolet and X-Ray

Call for Papers

Developments in laser technology over the last twenty years have led to the generation of pulses as short as a few femtoseconds, providing a unique tool for high-resolution time-domain spectroscopy, a capability that has revolutionized many areas of science, offering unprecedented insights into ultrafast dynamics of matter. However, femtosecond optical lasers are limited by the fact that the structural arrangement and motion of nuclei are not directly accessible from measured optical properties. This scientific gap has been filled by ultrafast light sources operating in the extreme ultraviolet (EUV) and X-ray spectral regions, such as high-order laser harmonics and free electron lasers. The manipulation and characterization of such ultrashort and ultraintense pulses require the introduction of new techniques and new classes of experiments.

We invite investigators in this and related fields to contribute original research articles as well as review articles to stimulate the continuing development of the field of ultrafast EUV and X-ray beamlines and diagnostics. Potential topics include, but are not limited to:

- Short-wavelength ultrafast light sources on the femtosecond and attosecond timescale
  - High-order laser harmonics
  - Free electron lasers
  - Novel ultrafast sources
  - Femtosecond and attosecond science
  - Ultrafast beamline architectures
- Optical components for handling and manipulation of ultrafast EUV and X-ray beams
  - Optical techniques for pulse compression
  - UV- and X-ray optics for ultrashort/ultraintense pulses
  - Coherence preservation and wave front measurements
  - Modeling and simulations of beamlines and optical systems
  - Beam splitting
  - Multilayer optics
  - Optical Metrology
  - Microfocusing
- Ultrafast beam diagnostics
  - Temporal characterization of ultrafast EUV and X-ray beams
  - Lateral characterization of the focused EUV and X-ray beams
  - Advanced diagnostics for the measurement of coherent EUV and X-ray beam properties
  - Waveform control, stabilization, shaping, and applications

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