

Carrier-envelope-phase detection of ultrashort laser pulses

We present a comprehensive method for the temporal characterization of visible near-infrared octave-spanning ultrashort laser pulses using an all-optical, all-solid-state, fully inline dispersion-scan device based on second-harmonic generation. Additionally, we show how the carrier-envelope phase (CEP) can be tagged using a fast line-scan camera operating at 100 kHz. We also introduce a single-shot, high-repetition-rate scheme for measuring the CEP offset of these pulses. The spectral fringes resulting from ω -to- 2ω nonlinear interferometry, encoding the CEP, are evaluated entirely optically via an optical Fourier transform. Demonstration involves measuring the CEP of a 200 kHz, few-cycle optical parametric chirped-pulse amplification (OPCPA) laser system using an interferometer as a periodic optical filter.