

Transform-limited Attosecond Pulse Generation

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High harmonics can form an attosecond pulse train or an isolated single attosecond pulse. Due to intrinsic chirp structure the duration of high harmonic attosecond pulses is usually much longer than the transform-limited pulse duration. The temporal characterization of attosecond harmonic pulses by the RABITT (reconstruction of attosecond beating by interference of two-photon transition) or FROG (frequency-resolved optical gating) method also confirmed this chirped structure. We proposed the compensation of the attosecond chirp by material dispersion and showed that the positive attosecond chirp, contained in short-trajectory harmonics, can be compensated by passing the harmonic pulse through a medium with negative group delay dispersion (GDD). The experimental verification of this idea was first demonstrated using Al as the compensator by the Lund group. The application of the chirp compensation in the harmonic generation medium itself was also demonstrated by our group.