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Atomic physics with attosecond pulses

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MB1.pdf**Atomic Physics with Attosecond Pulses**

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The availability of light sources of attosecond duration and of spectroscopic techniques that are capable of measuring three-dimensional electron/ion momentum maps opens new avenues for measurements of fundamental atomic and molecular properties.

In the work presented, we study the angular and energy-resolved electron emission from atoms exposed to a train of attosecond pulses in presence of a strong infrared laser field, using a velocity map imaging technique. The angular distributions depend on the timing of injection of the electron wave packets in the continuum relative to the laser cycle. We observe interference effects between wave packets created at a given time in the infrared cycle and those created half a cycle later. Information on the phase of the electron wave packet can be extracted by analyzing interference patterns obtained when two momentum-sheared electron wave packets interfere, in a way resembling spectral-shearing interferometry.