Abstract Submitted for the DAMOP10 Meeting of The American Physical Society

Oscillating ionization probability of hydrogen and helium atoms in a single XUV attosecond and delayed few-cycle infrared laser pulses¹ FENG HE, UWE THUMM, James R. Macdonald Laboratory, Kansas State University — By solving the time-dependent Schrödinger equation, we study the ionization of hydrogen and helium atoms in a single attosecond pulse and a delayed few-cycle femtosecond laser pulse. The attosecond XUV pulse pumps the electron to a certain excited state, and the time-delayed femtosecond laser pulse ionizes the excited atom. The ionization probability is found to oscillate as a function of the time delay between such pump and probe pulses. The oscillation period of the ionization signal is half of the probe pulse period, regardless its wavelength. The ionization probability is largest when the attosecond pulse coincides with a peak of the carrier oscillation of the infrared probe pulse. In contrast, ionization is suppressed when the attosecond pulse coincides with a node of the laser electric field.

¹Supported by the US DOE and the NSF

Feng He James R. Macdonald Laboratory, Kansas State University

Date submitted: 21 Jan 2010

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