Abstract Submitted
for the DAMOP10 Meeting of
The American Physical Society

Double Ionization of Helium in Combined Fields of Intense Near-infrared and VUV Laser Pulses[1] SHAOHAO CHEN, JILA, University of Colorado, Boulder, CO 80309-0440, ANDREAS BECKER, JILA and Department of Physics, University of Colorado, Boulder, CO 80309-0440 — Double ionization of He provides fundamental insights into the role of electron-electron correlation. The advent of sub-femtosecond laser technology with the generation of attosecond pulses in recent years has opened new perspectives towards the observation of the correlated electron dynamics on its natural time scale. In this work, we investigate the application of a VUV attosecond pulse to resolve sub-cycle correlated electron dynamics during the nonsequential double ionization process induced by an intense near-infrared laser field. To this end, we explore the relevant parameter regime (intensity, wavelength, pulse duration) of the VUV probe pulse by studying the ionization yields from scaled one-electron atoms. Then we solve the time-dependent Schrodinger equation based on a three-dimensional model for He atom, and study single and double ionization of the He atom induced by overlaping and nonoverlapping near-infrared and VUV pulses. The results calculated with and without the VUV pulse will be compared and discussed.

[1]Supported by NSF.

Andreas Becker
JILA and Department of Physics,
University of Colorado, Boulder, CO 80309-0440

Date submitted: 22 Jan 2010 Electronic form version 1.4