Abstract Submitted
for the DAMOP13 Meeting of
The American Physical Society

Numerical Simulations of Single Photon Double Ionization of the Helium Dimer[1] HONGCHENG NI, JILA and Department of Physics, University of Colorado, Boulder CO USA, CAMILO RUIZ, Centro de Laseres Pulsados Ultracortos Ultraintensos (CLPU), Salamanca Spain, REINHARD DORNER, Institut fur Kernphysik, Goethe Universitat, Frankfurt Germany, ANDREAS BECKER, JILA and Department of Physics, University of Colorado, Boulder CO USA — We study the energy exchange via electron correlation upon photon absorption over large distances in double photoionization of the helium dimer. Results of numerical simulations of the interaction of a planar helium dimer model with a short light pulse are found to be in good agreement with recent experimental data for the angular distribution of the emitted electron. The double ionization probability is closely related to that of the photoemission of an electron from one of the helium atoms along the internuclear axis. This provides direct evidence for the knockoff mechanism by which the photon energy is shared between the electrons over distances of several Angstroms in the dimer. Furthermore, our simulations are able to visualize the knockoff process as a function of time.

[1]Supported by NSF: TAMOP

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Date submitted: 24 Jan 2013 Electronic form version 1.4