Abstract Submitted
for the DAMOP13 Meeting of
The American Physical Society

Dissociation dynamics of Ar2+ in two-color intense laser fields[1]

M. MAGRAKVELIDZE, Physics Department, Kansas State University, J. WU, East China Normal University, Shanghai, R. DOERNER, Institut fuer Kernphysik Universitaet Frankfurt, U. THUMM, Physics Department, Kansas State University

— We demonstrate that the dissociation of singly ionized argon dimers can be controlled with two laser pulses of different wavelength. We used 790 nm pump and 1400 nm probe pulses with intensities of 10^{14} W/cm^2 to study the dissociation dynamics by analyzing kinetic-energy release spectra as a function of the pump-probe delay. The kinetic energy-release spectra are recorded using a COLTRIMS [1-2] setup and compared with model calculations based on the numerical propagations of the time-dependent Schrödinger equation [2-3]. We find that the measured spectra are best reproduced by the calculations that include the adiabatic electronic states $\mathrm{I}(1/2)_\mathrm{u}$ and $\mathrm{II}(1/2)_\mathrm{g}$ of Ar_2^+. The comparison of the measured and calculated spectra allows us to identify striking frustrated dissociation mechanism.

[1] J. Wu, A. Vredenborg, B. Ulrich, L. Ph. H. Schmidt, M. Meckel, S. Voss, H. Sann, H. Kim, T. Jahnke, and R. Dörner, PRA **83**, 061403(R) (2011)
[2] J. Wu, M. Magrakvelidze, A. Vredenborg, L. Ph. H. Schmidt, T. Jahnke, A. Czasch, R. Dörner, and U. Thumm, Phys. Rev. Lett. **110**, 033004 (2013)
[3] M. Magrakvelidze, F. He, Th. Niederhausen, I. V. Litvinyuk, and U. Thumm, PRA **79**, 033410 (2009)

[1]Supported by the US NSF and DOE.

Uwe Thumm
Physics Department, Kansas State University

Date submitted: 25 Jan 2013 Electronic form version 1.4