Abstract Submitted
for the DAMOP10 Meeting of
The American Physical Society

***Ab Initio* 6D Treatment of the Time-Evolution Multiphoton Dynamics for Two-Electron Systems in Few-Cycle XUV Laser Pulses** JOHN HESLAR, National Taiwan University, SHIH-I CHU, University of Kansas, National Taiwan University — We present a 6D *time-dependent generalized pseudospectral* (TDGPS) approach in *spherical coordinates* for fully *ab initio* nonperturbative treatment of multiphoton dynamics of atomic systems in intense laser fields. Based on the generalized pseudospectral method, an optimal space discretization is developed for the radial and angular grids in spherical coordinates. The procedure is applied to the investigation of high-order-harmonic generation (HHG) of helium atoms in intense ultrashort laser pulses. The 6D time-dependent Schrodinger equation equations are discretized and solved efficiently and accurately by means of the TDGPS method. This method is accurate and efficient and beyond the TD-hyperspherical coordinate methods. We extend the new approach to the nonperturbative treatment of double ionization of the helium atom in intense high-frequency xuv laser pulses.

John Heslar
National Taiwan University

Date submitted: 20 Jan 2010 Electronic form version 1.4