

Abstract Submitted  
for the DAMOP12 Meeting of  
The American Physical Society

**Time-Dependent Dirac Equation for Diatomics in SuperIntense Laser Fields -Numerical and Analytical results** ANDRE D. BANDRAUK<sup>1</sup>, Canada Research Chair,Universite de Sherbrooke, FRANCOIS FILLION-GOURDEAU<sup>2</sup>, Centre de recherches mathematiques — Numerical methods for solving the one-electron diatomic molecular Dirac equation in ultrashort(few cycles) superintense laser pulses are developped without Fermion-doubling. A split-operator method, originally developped for nonrelativistic time-dependent molecular problems is generalized using the method of characteristics [1]. Analytic results are also presented for a superintense static electric field to evaluate relativistic effects in diatomic CREI-Charge Resonance Enhanced Ionization [2].

[1] E Lorin, AD Bandrauk, Nonlinear Analysis, 12, 190(2011).

[2] T Zuo, AD Bandrauk, Phys Rev A 54,2511 (1995).

<sup>1</sup>Faculte des Sciences, Universite de Sherbrooke, QC, J1K 2R1, Canada

<sup>2</sup>Universite de Montreal, QC, H3T 1J4, Canada

Andre D. Bandrauk  
Canada Research Chair,Universite de Sherbrooke

Date submitted: 24 Jan 2012

Electronic form version 1.4