Abstract Submitted
for the DAMOP12 Meeting of
The American Physical Society

Exploring the high-order harmonic generation from Rydberg states with a fixed Keldysh parameter[1] ERDI ATA BLEDA, ILHAN YAVUZ, ZIKRI ALTUN, Marmara University, TURKER TOPCU, Auburn University — The commonly adopted viewpoint that the Keldysh parameter γ determines the dynamical regime of ionization in strong field physics has long been demonstrated to be a misleading one. One can then ask what happens in strong field ionization as relevant parameters, such as laser intensity and frequency, are varied while keeping γ fixed. We present results from our simulations of high-order harmonic generation (HHG) from Rydberg states of a hydrogen atom. We calculate high harmonic spectra from various initial states with n up to 42, where the laser intensities and the frequencies are scaled from those for $n = 1$ in order to maintain a fixed Keldysh parameter $\gamma < 1$. We find that as we go up in n for a fixed γ, the position of the cut-off scales as $\sim 1/n^2$ in terms of the cut-off law predicted by the three-step model for $n = 1$. However, a secondary cut-off structure forms below this, which moves to lower harmonics as n is increased. This second cut-off splits the plateau into two regions, one higher in yield and below the second cut-off, and the second with lower yield following it. We further investigate the final n-distributions for some of the interesting cases to elucidate the physical mechanism leading to this structure

[1]IY and ZA was suported by BAPKO of Marmara University. TT was supported by the Office of Basic Energy Sciences, US Department of Energy.

Turker Topcu
Auburn University

Date submitted: 27 Jan 2012 Electronic form version 1.4