

Abstract Submitted  
for the DAMOP17 Meeting of  
The American Physical Society

**Harmonic generation of Li atoms in Rabi-flopping regime**<sup>1</sup> KOBRA NASIRI AVANAKI, The University of Kansas, DMITRY A. TELNOV, St. Petersburg State University (Russia), SHIH-I CHU, The University of Kansas — We study harmonic generation of Li atoms in one- and two-photon Rabi-flopping regimes where the population transfer from the ground  $2s$  state to the excited  $2p$ ,  $3s$ , and  $3d$  states is significant. Our theoretical approach is based on the time-dependent density-functional theory taking into account dynamic multielectron response to the external field. In the one-photon Rabi-flopping regime between the  $2s$  and  $2p$  states, the harmonic spectrum exhibits a fine oscillatory structure, with the spacing between the adjacent subpeaks equal to twice the Rabi frequency. The structure originates from the low-frequency modulation of the time-dependent dipole moment due to oscillations of the electronic population between the  $2s$  and  $2p$  states. For higher laser intensities, the pattern in the harmonic spectrum becomes more complex because of the population transfer to other excited states and pulse shape effects. Using the concept of adiabatic Floquet states, we show that interference of the contributions to the harmonic signal from the leading and trailing edges of the laser pulse also results in a fine structure of the harmonic peaks but on a smaller frequency scale. Similar structures in the harmonic spectra are observed in the two-photon Rabi-flopping regimes as well.

<sup>1</sup>This work is partially supported by DOE.

kobra nasiri avanaki  
The University of Kansas

Date submitted: 19 Jan 2017

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