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Resonance-Enhanced Multiphoton Processes by Means of High-Order Harmonic Generation Precision Comb Spectroscopy. JUAN J. CARRERA, National Taiwan University, SHIH-I. CHU, University of Kansas, National Taiwan University — Resonance-enhanced multiphoton transitions take place when a train of time-delayed coherent pulses interact with atomic systems. We accurately probe the first five excited electronic states and their corresponding transitions to the ground state. As the density of the frequency comb modes increases around each resonance frequency with increasing time delay, simultaneous comb modes of the driving laser field greatly amplify the low-lying transitions to the ground state. The spectral comb modes are farther fine-tuned by adjusting the offset angular frequency controlled by the pulses-to-pulse laser phase difference. In addition, we investigate n-photon excitation processes indicating the existence of n-resonance peak positions of the offset angular frequency.

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