

Abstract Submitted  
for the DAMOP16 Meeting of  
The American Physical Society

**Quantum control in a seven-level system using optical frequency combs modulated from both the temporal and spectral domains**  
GENGYUAN LIU, SVETLANA MALINOVSKAYA, Stevens Inst of Tech — We present a method that makes use of the modulated optical frequency combs to perform two-photon Raman transitions in a stepwise manner in the framework of a semiclassical seven-level system. The phase of optical frequency combs is sinusoidally modulated from both the time domain and the frequency domain. Dressed states analysis is applied to reveal the mechanism of adiabatic passage of the population transfer. Odd parity of the spectral and temporal modulation shown to lead to a creation of the dark state, which may have useful applications to mitigate decoherence. A uniformity of quantum control approaches from both the temporal and spectral domains is clarified by using Wigner distribution analysis.

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Date submitted: 28 Jan 2016

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