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Adiabatic Control of Two-Photon Transitions via Optical Frequency Comb[1] SVETLANA MALINOVSKAYA, Stevens Institute of Technology — We show that a phase modulated frequency comb can be used to perform two-photon transitions between molecular vibrational levels forming three-level λ-system. The phase across a single pulse in the pulse train is modulated by a sin-function with a carefully chosen amplitude and modulation frequency. Partial adiabatic population transfer to the final state is fulfilled by each pulse in the applied pulse train providing a controlled population accumulation in the final state. Detuning the pule train parameters to less than the frequency difference between the initial and final states in the λ-system changes the time scale of molecular dynamics but leads to the same complete population transfer. The proposed scheme may be used to form ultracold molecules, e.g., KRb.

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