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**Control of decoherence accompanying Raman transitions by odd and even chirps of optical frequency combs**[1] SVETLANA MALINOVSKAYA, Stevens Institute of Technology — We discuss femtosecond Raman type techniques to control molecular vibrations by implementing phase modulated optical frequency combs. These techniques make use of multiple two-photon resonances induced by optical frequencies present in the comb. They provide a tool to study the details of molecular dynamics in systems with decoherence. We analyze the spectral properties of odd and even chirps of the optical frequency comb in the form of sine and cosine functions and the effects they cause on the population transfer. We show that the odd chirp leads to population transfer in the presence of decoherence while the even chirp maximizes coherence between the initial and the final state. The results justify the importance of the parity of the chirp in achieving the desired quantum yield [1].

[1] S.A. Malinovskaya, S.L. Horton, "Impact of Decoherence on Internal State Cooling using Optical Frequency Combs," J. Opt. Soc. Am. B (2013).

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