

Abstract Submitted
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A Universal Mechanism for Ultrafast Laser Pulse Control of Vibrational Excitations¹ XIANG ZHOU, Texas A&M University, Wuhan University, ZHIBIN LIN, Texas A&M University, Colorado School of Mines, REMRSEC, CHENWEI JIANG, Texas A&M University, Xi'an Jiaotong University, ROLAND ALLEN, Texas A&M University — An important task for ultrafast laser techniques is to control the vibrational excitations of materials. Recently off-resonant ultrafast laser experiments show that the vibrational excitation modes and amplitudes depend on the properties of the laser pulses. A numerical-simulation investigation has suggested that the vibrational excitations depend only on the laser pulse duration, but did not provide a clear and satisfactory explanation. Our theoretical investigation for carbon nanotubes shows that there exists a universal mechanism for controlling vibrational excitations by ultrafast laser pulses, which is independently confirmed by our numerical simulations with semiclassical electron-radiation-ion dynamics (SERID).

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