

Abstract Submitted
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Non-Adiabatic Control of the Acetylene Dication Using an Infrared Field¹ CHELSEA LIEKHUS-SCHMALTZ, XIAOLEI ZHU, GREG MC-CRACKEN, Stanford University, JAMES CRYAN, PULSE Institute, PHILIP BUCKSBAUM, Stanford University — Non-adiabatic dynamics are affected by the relative speed of a molecular vibrational wavepacket with respect to the potential energy slope and splitting. We propose that a light field can control the kinetic energy of a molecular wavepacket in order to exert control in non-adiabatic regions. We call this type of control “kinetic energy control,” and examine how different photon energies affect the resultant molecular dynamics. To verify our proposal, we performed a control experiment on the acetylene dication deprotonation pathway using both 1300 nm and 800 nm light. We find that a simple parameter relating the speed and potential energy can be used to understand why 1300 nm light is a more effective control field.

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