

Abstract Submitted  
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**Towards coherent control of energetic material initiation**<sup>1</sup> MARGO GREENFIELD, SHAWN MCGRANE, DAVID MOORE, Los Alamos National Laboratory — Direct optical initiation (DOI) of energetic materials using coherent control of localized energy deposition requires understanding how the deposited energy produces a critical size hot spot, which allows propagation of the reaction and thereby initiation. The hot spot characteristics needed for growth to initiation can be studied using thin films of energetic materials. Achieving direct quantum controlled initiation (QCI) in thin film condensed phase systems requires optimally shaped ultrafast laser pulses to coherently guide the energy flow along the desired paths. As a test of our quantum control capabilities we have successfully demonstrated our ability to control the reaction pathway of the chemical system stilbene. An acousto-optical modulator based pulse shaper was used at 266 nm, in a shaped pump / supercontinuum probe technique, to enhance and suppress the relative yields of the cis- to trans-stilbene isomerization. The quantum control techniques tested in the stilbene experiments are currently being used to investigate QCI of thin films and solutions of several different explosives.

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