

Abstract Submitted
for the SHOCK11 Meeting of
The American Physical Society

Towards initiation of explosives utilizing ultrafast laser quantum control MARGO GREENFIELD, SHAWN MCGRANE, JASON SCHARFF, DAVID MOORE, Los Alamos National Laboratory — Time dependent shaped electric fields can be utilized to control energetic materials by driving their reaction to initiation. This direct quantum controlled initiation (QCI) employs ultrafast shaped ultraviolet light to optimally control the explosives initiation reaction. QCI will enhance the understanding of energetic material reactions by yielding insight into the characteristics, such as reaction dynamics, necessary for initiation. Initial investigation into solutions of hexanitroazobenzene (HNAB), trinitroaniline (TNA), 1,1-diamino-2,2-dinitroethene (FOX-7), and diaminoazozyfurazan (DAAF) have been performed. Novel transient absorption spectra have been obtained for each material and note worthy regions have been further investigated for simple control response. The explosives not controlled through a single parameter have been further investigated with complex control. Further experimentation will be performed to explore the effect of QCI on thin films as the optimally shaped ultrafast laser pulses guide the energy flow along the desired paths.

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Date submitted: 18 Feb 2011

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