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Novel energetic materials for quantum optical initiation ROBERT SCHARFF, MARGO GREENFIELD, SHAWN MCGRANE, DAVID MOORE, DAVID CHAVEZ, SERGEI TRETIAK, TAMMIE NELSON, Los Alamos National Laboratory — The development of new photoactive materials, which optically initiate through quantum controlled photochemical dynamics, would provide a transformational advancement in the laser-based ignition of energetic materials. Ideal materials should have low initiation thresholds for specific optical pathways while simultaneously having high initiation thresholds for all other conventional stimuli. Optical control can only be effective in newly designed materials that are synthesized to take advantage of such control; consequently, quantum control of optical initiation requires a thorough understanding of the excited state molecular dynamics that leads to photochemical decomposition. To date, our efforts have focused on making new materials with energetic optical chromophores and validation of their non-linear optical response properties through experiment and simulation.

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