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Toward Coherent Control of Cis-Stilbene Photodynamics JASON QUENNEVILLE, Los Alamos National Laboratory, TODD J. MARTINEZ, University of Illinois at Urbana-Champaign — Stilbene can undergo photoisomerization between its cis and trans isomers. Non-radiative quenching of excited state population to the ground state can occur at a twisted and pyramidalized conical intersection of S_0 and S_1 that is remarkably similar to that found for ethylene. In addition, photo-excited cis-stilbene can undergo a cyclization reaction giving 4a,4b-dihydrophenanthrene. Here, population decay occurs through a conical intersection in the cis-stilbene configuration. Both competing reaction pathways give appreciable reactant recovery. The product branching ratios can be directly related to the location of the conical intersections in nuclear coordinate space and also, more specifically, to the wavepacket dynamics in the nonadiabatic region. A significant effort is currently underway at Los Alamos to achieve coherent control of photo-excited cis-stilbene. The goal will be to design a shaped femtosecond laser pulse that will control photo-product yield. More importantly, we hope to gain an understanding of the important features of the optimized electric field and thus insight into the prospects for more complicated materials. We will detail the potential surfaces of photo-excited cis-stilbene, the initial S_1 dynamics, as well as opportunities for quantum control.

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