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Excited state dynamics & optical control of molecular motors TED WILEY, ROSEANNE SENSION, Univ of Michigan - Ann Arbor — Chiral overcrowded alkenes are likely candidates for light driven rotary molecular motors. At their core, these molecular motors are based on the chromophore stilbene, undergoing ultrafast cis/trans photoisomerization about their central double bond. Unlike stilbene, the photochemistry of molecular motors proceeds in one direction only. This unidirectional rotation is a result of helicity in the molecule induced by steric hindrance. However, the steric hindrance which ensures unidirectional excited state rotation, has the unfortunate consequence of producing large ground state barriers which dramatically decrease the overall rate of rotation. These molecular scale ultrafast motors have only recently been studied by ultrafast spectroscopy. Our lab has studied the photochemistry and photophysics of a "first generation" molecular motor with UV-visible transient absorption spectroscopy. We hope to use optical pulse shaping to enhance the efficiency and turnover rate of these molecular motors.

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