

## Multi-Color Gas Phase Spectroscopy and Dynamics

We have recently developed several new experimental approaches to explore sub-picosecond molecular dynamics using synchrotron radiation. Following the manipulation of electronic excited states of a gaseous target using two or more laser pulses, we probe the final states using soft x-ray photons as a function of x-ray energy, laser pulse energy and wavelength, laser-laser time delay and laser-synchrotron time delay using transient absorption techniques.

Our focus in this presentation is on the development and first experiments with a 40-micron photoabsorption gas cell, space and time overlap tools and data acquisition systems.

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