Abstract Submitted
for the DAMOP13 Meeting of
The American Physical Society

Sub-millisecond Transient Absorption Frequency Comb Spectroscopy in the Mid-Infrared Spectral Region BRYCE BJORK, ADAM J. FLEISHER, JILA, National Institute of Standards and Technology and University of Colorado, Department of Physics, THINH BUI, Arthur Amos Noyes Laboratory of Chemical Physics, California Institute of Technology, KEVIN COSSEL, JILA, National Institute of Standards and Technology and University of Colorado, Department of Physics, MITCHIO OKUMURA, Arthur Amos Noyes Laboratory of Chemical Physics, California Institute of Technology, JUN YE, JILA, National Institute of Standards and Technology and University of Colorado, Department of Physics
— The study of highly-reactive transient reaction intermediates is fundamental to understanding chemical dynamics and is particularly relevant to applications such as atmospheric chemistry. Their study often poses a significant challenge for traditional spectrometers, which typically provide broad bandwidth or fast temporal resolution, but not both without long acquisition times. We introduce a cavity-enhanced frequency-comb solution that allows for high-resolution, sensitive spectra to be captured at millisecond intervals in the mid-infrared spectral region using a VIPA dispersive etalon. Once individual comb teeth are resolved, the spectral resolution of the system is limited by the comb linewidth (<40 kHz) while the temporal resolution is limited by the minimum integration time of the InSb detector array (10 μs). In this presentation, I will present the application of this real-time spectroscopic system to small molecule photodissociation.

Bryce Bjork
JILA, National Institute of Standards and Technology and
University of Colorado, Department of Physics

Date submitted: 30 Jan 2013 Electronic form version 1.4