Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Effect of Pulse Duration and Excitation Wavelength on the Rate of Dynamic Stokes Shift ARKAPRABHA KONAR, VADIM LOZOVOY, MARCOS DANTUS, Michigan State University — Solvation of large organic molecules and biomolecules has been widely investigated and understood over the years through various spectroscopic techniques. We have recently studied the nonlinear optical effects of excitation of IR144 in methanol, at room temperature using chirped femtosecond pulses and have found that the characteristic relaxation times between excited and fluorescent states of this system ranges from 20-40 fs. Here we have used a tunable broadband source coupled with a phase and amplitude pulse shaper to investigate the effects of pulse duration and excitation wavelength on the rate of Dynamic Stokes Shift of laser dyes. We take advantage of the relation between chirp in frequency domain and the chirp in time domain to calculate the rate of Dynamic Stokes Shift. The effect of changing the excitation wavelength is even more interesting. Negatively detuned (from absorption maxima) pulses do not induce any change in rate of DSS, however, positively detuned pulses induce an exponential rise in the rate of DSS. These observations give additional experimental background knowledge for deeper understanding of the dynamics of the excited state of large organic molecules in solution.

Arkaprabha Konar
Michigan State University

Date submitted: 11 Nov 2013 Electronic form version 1.4