

Abstract Submitted  
for the DAMOP07 Meeting of  
The American Physical Society

**Effects of coupling between the vibrational modes on CARS signal** VISHESHA PATEL, SVETLANA MALINOVSKAYA, Stevens Institute of technology — CARS is well suited spectroscopy method for imaging specific molecules, e.g., proteins and live cells, diagnosis of cancerous cells, imaging dueterated compounds, etc. CARS imaging techniques avoid problems associated with photo bleaching and photo induced toxicity. The CARS signal is accompanied by a strong non resonant background which may overshadow the weak signal of interest. Two methods, using femtosecond chirped laser pulses and providing the Rabi oscillation and the adiabatic passage type of control [1], allow one to achieve sensitivity with high resolution and are known to efficiently suppress background. It has been previously shown that coupling between vibrational modes affects the sensitivity of the Raman signal and selective excitation of vibrational modes [2]. In this paper we will discuss simulation results on vibrational coupling between modes and its impact into control mechanisms of the CARS signal.

[1] S.A.Malinovskaya, Physical.Rev.A 73, 033416(2006)

[2] S.A. Malinovskaya,P.H. Bucksbaum, and P.R. Berman, J. Chem. Phys. 121, 3434 (2004).

Vishesha Patel  
Stevens Institute of Technology

Date submitted: 02 Feb 2007

Electronic form version 1.4