Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Polarization Sensitive Measurements of Molecular Reorientation in a Glass Capacitor Cell NATHAN COOPER, CARLOS LAWHEAD, JOSIAH ANDERSON, TEGAN SHIVER, CHANDRA PRAYAGA, LASZLO UJJ, University of West Florida — It is well known that molecules having a permanent dipole moment tend to orient in the direction of the electric field at room temperature. The reorientation can be probed with the help of linear spectroscopy methods such as fluorescence anisotropy measurements. We have used nonlinear polarization sensitive Raman scattering spectroscopy [1] to quantify the orientation effect of the dipoles. Vibrational spectra of the molecules has been recorded as a function of the external electric field. The polarization changes observed during the measurement are directly linked to the molecular reorientation rearrangement. Spectra has been recorded with a laser spectrometer comprised of a Nd:YAG laser and an optical parametric oscillator and an imaging spectrometer with a CCD detector. In order to make this measurement we have constructed a glass capacitor cell coated in TiO and applied a significant electric field (0-3 kV/mm) to the sample. Our measurements showed that the orientation effect is most significant for liquid crystals as observed previously with non-polarization sensitive CARS spectroscopy [2]. Reference: 1. El-Diasty, F. 'Coherent anti-Stokes Raman scattering: Spectroscopy and microscopy" Vibrational Spectroscopy 55 (2011) 1-37. 2. Kachynski, A., et al. "Realignment-enhanced coherent anti-Stokes Raman scattering (CARS) and three-dimensional imaging in anisotropic fluids" Opt. Express (2008).

Nathan Cooper
University of West Florida

Date submitted: 15 Nov 2013 Electronic form version 1.4