Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Quadratic Electro-optic Measurements in Nonconjugated Conductive Polymers, iodine-doped Polyisoprene and Poly(β-pinene) at 1.55μm ANANTHAKRISHNAN NARAYANAN, JITTO TITUS, MRINAL THAKUR, Photonic Materials Research Laboratory, Auburn University, AL — Exceptionally large near-resonant (at 633nm) quadratic electro-optic effects in nonconjugated conductive polymers, iodine-doped poly(β-pinene) and 1,4-cis-polyisoprene have been previously reported. In this report, we discuss the quadratic electro-optic effects in these polymers at 1.55μm. The measurements were made using the field-induced birefringence technique. A modulation depth of about 0.1% was observed for a 1 μm thick sample of doped poly(β-pinene) at an applied field of 1V/μm. The Kerr coefficient as determined was about 1.6×10^{-10} m/V^2. For polyisoprene samples the modulation was slightly smaller. These exceptionally large Kerr coefficients at a technologically important wavelength make these polymers promising for guided-wave applications in electro-optics. Techniques for longer-term stability of the samples have been established. The large optical nonlinearities as observed have been attributed to the sub-nanometer confinement of these charge-transfer systems

Mrinal Thakur

Date submitted: 20 Nov 2008 Electronic form version 1.4