

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Optical measurements of mechanical resonances in biological tissues via magnetic nanoparticle interrogation VASILICA CRECEA, STEVEN ADIE, University of Illinois at Urbana-Champaign, AMY OLDENBURG, University of North Carolina at Chapel Hill, RENU JOHN, Indian Institute of Technology - Hyderabad, STEPHEN BOPPART, University of Illinois at Urbana-Champaign — We present a real-time phase-resolved optical coherence tomography-based technique that interrogates the mechanical properties of tissue phantoms with different elasticities as well as healthy and cancerous rat tissues, via the interaction of high susceptibility iron oxide nanoparticles that reside inside the samples and an external magnetic field. A chirped magnetic field selects the region of natural resonance in the probed samples as evidenced by scatterer displacements measured with nanometer-level sensitivity. This methodology, entitled magnetomotive optical coherence elastography (MM-OCE), which exploits frequency dependent viscoelastic response in biological media, has potential for detecting tissue pathologies.

Vasilica Crecea
Univ of Illinois Urbana-Champaign

Date submitted: 07 Dec 2010

Electronic form version 1.4