1079-00-214 **Christopher John Gillam*** (cgillam@clemson.edu), O-110 Martin Hall, Box 340975, Clemson, SC 29634. *Wave Direction-based Reconstruction of Stiffness in Magnetic Resonance Elastography.*

Magnetic Resonance Elastography is a useful noninvasive medical diagnosis technique for detecting early stage cancer by comparing the stiffness of tissue. In Magnetic Resonance Elastography, a vibrating transducer sends the wave into the body which is captured by the motion encoding gradient. Our goal is to reconstruct the stiffness distribution from the interior wave. On a small window, a simple one dimensional minimization is used to calculate the wave direction. Using the wave direction, a Fourier transform technique will reconstruct the local stiffness. Compared to another known algebraic direct inversion technique, this presented reconstruction is resilient to noise and more accurate in reconstructed stiffness value. Moreover, when combined with the known direct inversion method, it provides a stable and improved reconstruction in shape and value. These reconstruction methods are tested using simulations under noisy conditions and with data provided from the Mayo Clinic. (Received January 13, 2012)