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Sunnie Joshi* (sjoshi@math.tamu.edu), Department of Mathematics, Texas A&M University, College Station, TX 77843, and **Abner J. Salgado**. *Estimating Physical Parameters of Soft Tissues Using Inverse Spectral Theory*.

Inverse problems arise in many areas of science and mathematics, including geophysics, astronomy, acoustic tomography and medical biology. Inverse Sturm-Liouville problems (SLP) is a branch of inverse problems that has applications in most of these areas and have been studied since the early 1900s. Our motivation for studying such problems comes from an application in biomechanics, particularly in estimating material parameters for soft tissues. In this talk, we will propose a constructive numerical algorithm based on finite element methods to recover the potential for a SLP using least squares formulation. Some theoretical analysis will be presented along with some numerical results to show the availability of the method. (Received January 18, 2012)