1125-65-948 **Melody Alsaker*** (alsaker@gonzaga.edu). *Electrical Impedance Tomography Imaging of Experimental Data Using a D-bar Method with an Optimized Prior.*

Electrical Impedance Tomography (EIT) is a medical imaging technology wherein the internal electrical properties of a body are reconstructed, via a mathematical inversion process, using only surface measurements. There are many potential applications of EIT, including human thoracic imaging. EIT has advantages in its low cost, portability, and absence of ionizing radiation. However, EIT involves solving a nonlinear and extremely ill-posed inverse problem, so images suffer from poor spatial resolution. Recent advancements in direct, nonlinear D-bar reconstruction methods have produced an algorithm in which enhanced spatial resolution is achieved by embedding prior information, in the form of organ boundaries and conductivity estimates, directly into the algorithm. This method has been previously shown to be effective on reconstructions of simulated thoracic data. We present here a new method for constructing the prior, in which conductivity estimates and regularization parameters are automatically selected so as to optimize a nonlinear Fourier transform crucial to the method, thus minimizing guesswork and increasing efficiency. The method is demonstrated to be effective in enhancing spatial resolution of reconstructions of experimentally collected data from agar thoracic phantoms. (Received September 14, 2016)