1106-65-860 **Sarah Jane Hamilton*** (sarah.hamilton@marquette.edu), Cudahy Hall, 355, P.O. Box 1881, Milwaukee, WI 53201-1881. *Pulmonary imaging using Electrical Impedance Tomography with a Direct D-bar Admittivity Method.* Preliminary report.

Electrical Impedance Tomography (EIT) is a non-invasive imaging modality in which harmless currents are applied on electrodes placed at the surface of a body, and the resulting voltages are measured. From these surface electrical measurements, one recovers the internal conductivity and permittivity (admittivity) of the body and forms images that a doctor can use for diagnostic/evaluative purposes. EIT is of particular interest for pulmonary imaging of patients in the ICU on respirators and provides a noninvasive bedside assist for medical professionals to monitor and evaluate proper air volume in the lungs as both over and under inflation are detrimental to the patient. The reconstruction task is a highly ill-posed nonlinear inverse problem, which is highly sensitive to noise, and requires the use of regularized solution methods such as the D-bar method. The D-bar method is based on a tailor made scattering transform, a nonlinear Fourier transform, which solves the inverse problem uniquely. In this talk, we discuss the expansion of D-bar methods from conductivity only imaging, to permittivity imaging. Internal conductivity and permittivity reconstructions from experimental tank and human chest EIT measurements are presented. (Received September 08, 2014)