ACOUSTIC MICROSCOPY OF LIVER TISSUE WITH A C-SCAN ULTRASOUND IMAGING SYSTEM. ***Jeff Meade (CIS-COS),*** *Dr. Maria Helguera (CIS-COS), Dr. Dan Phillips (COE), Dr. Bruce Kahn (CIAS)*

Ultrasound is primarily used to image relatively large structures in the body. Due to frequency dependent attenuation of the acoustic pressure waves utilized for imaging, a trade-off exists between penetration depth and target resolution. A 15-25 MHz ultrasonic C-Scan system is being characterized for its suitability to examine tissue structure by means of acoustic microscopy. The system response has been characterized by calculating both the MTF (Modulation Transfer Function) from knife-edge targets and examining the response to a halftone grey scale printed on Cyrel, a photopolymer, using a traditional flexography process. The system was found to have a linear relationship between the mean pixel values of the halftone target image and the surface area of the halftone target in contact with the c-scanner. An optical scanner was used to capture an image of a liver histology sample. Image processing was used to create an outline of the underlying tissue morphology, which was printed on EPIC, a photopolymer, forming what is commonly referred to as an imaging phantom. The C-Scan system was then used to create an image of the phantom, which was visually compared to the original histology sample. Further analysis will entail statistical analysis of both the histology and phantom images.