Near Infrared Noninvasive Optical Imaging on an object hidden in a chicken breast ELAINE TENNANT, WILHELMUS GEERTS, ZVI YANIV, DONALD SCHROPP, Texas State University — Non-invasive optical imaging by speckle ensemble (NOISE) is a technique for taking an image of an object while it is embedded between two scattering mediums. These mediums can be anything from smoke to frosted glass to biological tissue. The images taken of the object are speckled because of the scattering of the light by the medium surrounding the object. In order to reduce the effect of the scattering we have taken multiple images from different direction using a multi lens array. After running an algorithm that averages all the images together, the scattering has been compensated for and the object becomes obvious. These methods have applications in medical, military and even law enforcement fields. Human tissue is an appropriate scattering medium and has an added benefit of being partially transparent to light in the near infrared spectrum. This property can be exploited for medical purposes. We have built a NOISE setup at our University that works in the infrared and have used it to study a binary object embedded in two centimeters of chicken breast (used to simulate human tissue). An average of one hundred separate speckle images was taken to extract a clear picture of the object. Images were also taken with different scattering mediums. These preliminary results as well as the constructed setup will be discussed.

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