1146-35-314 **Sanwar Uddin Ahmad*** (sanwara@clemson.edu), Clemson, SC 29631, **Thilo Strauss** (thilum@gmx.de), , Germany, and **Taufiquar Khan** (khan@clemson.edu). *Diffuse Optical Tomography Using Iteratively Regularized Gauss-Newton Method In Comparison to Statistical Inversion Method.* Preliminary report.

Diffuse Optical Tomography (DOT) is a well-known imaging technique for probing highly scattering media by using low-energy visible or near-infrared light. The inverse problem of DOT is severely ill-posed and consists of reconstructing an image of the optical properties (absorption and diffusion coefficients) of the tissue from measurements of photon density on the boundary. In this presentation, we discuss the implementation of the Iteratively Regularized Gauss-Newton (IRGN) method for DOT model. We present the results of our algorithm using simulations and perform computational analysis of the convergence and accuracy of the obtained distributions of the diffusion and the absorption coefficient. Furthermore, we compare the results with Bayesian inversion using Markov Chain Monte Carlo method. We also propose a method that combines the deterministic and statistical approaches for faster convergence. (Received January 25, 2019)