1146-65-327   **Thowhida Akther*** (`takther@clemson.edu`), **Sanwar Uddin Ahmad** (`sanwara@clemson.edu`) and **Taufiquar Khan** (`khan@clemson.edu`). *1D Diffuse Optical Tomography Using A Variationally Constrained Nonlinear Optimization Framework.* Preliminary report.

Diffuse Optical Tomography (DOT) is an emerging modality for soft tissue imaging with various medical applications. However, it is well known that DOT image reconstruction is unstable due to the ill-posedness of the inverse problem. Typically such problems are solved using nonlinear techniques for example using the Gauss-Newton method in which the forward model constraints are implicitly incorporated. In this paper, we solved the 1D DOT inverse problem by formulating it as a variationally constrained non-linear optimization problem with Newton's iteration. We present the results of our method and the accuracy of the obtained distribution of the diffusion coefficient parameter for different noise level. (Received January 25, 2019)