1154-65-1775 **Kit Newton*** (kcnewton@math.wisc.edu) and **Qin Li**. *Stability deterioration of diffuse optical tomography in the Bayesian framework.*

Optical tomography is a medial imaging technique in which the properties of biological tissue are reconstructed using measurements of incoming and outgoing light intensity. Mathematically, the radiative transfer equation (RTE) models the dynamics,and certain coefficients in the RTE characterize the tissue's properties. Reconstructing the coefficients constitutes an inverse problem. In the strong scattering regime, the RTE is asymptotically equivalent to the diffusion equation (DE), and the inverse problem may similarly be solved to reconstruct the coefficients. However, while the inverse problem for the RTE is well-posed, the inverse problem for the DE is logarithmically unstable. We study the deterioration of the stability of the inverse problem in the high-diffusion case. In the Bayesian framework, we measure the information gained during the measurement by studying the Kullback-Leibler divergence between the posterior and prior distributions for the RTE. We show that in the strong scattering case, the KL divergence between the two goes to zero, meaning that the measurement provides little information in the high-scattering regime. (Received September 16, 2019)