

# International Journal of Biomedical Imaging

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Research Article

## Improving the Accuracy of the Diffusion Model in Highly Absorbing Media

Alexander X. Cong, Haiou Shen, Wenxiang Cong, and Ge Wang

Biomedical Imaging Division, School of Biomedical Engineering and Sciences, Virginia Polytechnic Institute and State University, 1880 Pratt Drive, Blacksburg 24061, VA, USA

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### Abstract

The diffusion approximation of the Boltzmann transport equation is most commonly used for describing the photon propagation in turbid media. It produces satisfactory results in weakly absorbing and highly scattering media, but the accuracy lessens with the decreasing albedo. In this paper, we presented a method to improve the accuracy of the diffusion model in strongly absorbing media by adjusting the optical parameters. Genetic algorithm-based optimization tool is used to find the optimal optical parameters. The diffusion model behaves more closely to the physical model with the actual optical parameters substituted by the optimized optical parameters. The effectiveness of the proposed technique was demonstrated by the numerical experiments using the Monte Carlo simulation data as measurements.