International Journal of Biomedical Imaging

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Mathematical Study and Numerical Simulation of Multispectral Bioluminescence Tomography

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Abstract

Multispectral bioluminescence tomography (BLT) attracts increasingly more attention in the area of optical molecular imaging. In this paper, we analyze the properties of the solutions to the regularized and discretized multispectral BLT problems. First, we show the solution existence, uniqueness, and its continuous dependence on the data. Then, we introduce stable numerical schemes and derive error estimates for numerical solutions. We report some numerical results to illustrate the performance of the numerical methods on the quality of multispectral BLT reconstruction.